

BOILERS AND RADIATORS



The H·B·SMITH CO.

WESTFIELD ^{MASS}
NEW YORK
BOSTON
PHILADELPHIA

Date 7/23

No. 13

Dr. 7







The H. B. SMITH CO.

WESTFIELD, MASS.

10 East 39th Street
NEW YORK

17th and Arch Sts.
PHILADELPHIA

138 Washington Street North
BOSTON

Pacific Coast Representatives:
HOLBROOK, MERRILL & STETSON
SAN FRANCISCO,
LOS ANGELES, CAL.

BOILERS USED EXCLUSIVELY FOR LOW PRES-
SURE STEAM AND HOT WATER HEATING
AND HOT WATER SUPPLY

BOILER AND RADIATOR
CATALOGUE NO. 1146

(Superseding No. 990)

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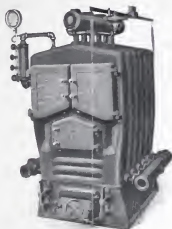
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BOILER RATING

Basis for Computing Size of Boilers

1. STEAM BOILER ratings are based on maintaining two pounds pressure at the boiler.
2. WATER BOILER ratings are based on the water being maintained at a temperature of 180 degrees at the boiler.
3. SUFFICIENT RADIATION must be installed to easily raise and maintain a temperature of 70 degrees.
4. RATINGS are for cast-iron DIRECT radiators with average amount of surface in MAINS, RISERS and RETURNS.
5. Usual allowance must be made for the use of PIPE COILS, WALL RADIATORS, DIRECT-INDIRECT RADIATORS, INDIRECT RADIATION and CONTINGENCIES.
 - (a) PIPE COILS or WALL RADIATORS. Each foot of surface is considered equivalent to $1\frac{1}{4}$ feet of direct radiation.
 - (b) DIRECT-INDIRECT RADIATORS. Each foot of surface is considered equivalent to $1\frac{1}{2}$ feet of direct radiation.
 - (c) INDIRECT RADIATION in a GRAVITY SYSTEM. Each foot of surface is considered equivalent to 2 feet of direct radiation.
 - (d) INDIRECT RADIATION in a FAN SYSTEM. Each pound of steam condensed per hour is equivalent to 4 feet of direct steam radiation.
 - (e) COIL WATER BACK or OTHER FITTINGS for HEATING WATER for HOT WATER SUPPLY. Each gallon storage capacity is considered equivalent to 2 feet of direct steam radiation or 3 feet of direct water radiation.
6. ALL MAINS (supplies, returns, risers, etc.) are to be figured as radiating surface.
 - (a) Under average conditions the allowance for mains, etc., may be considered equal to approximately 50% of the NET amount of DIRECT radiation. (See paragraph 5.)
7. LISTED RATINGS of boilers are determined by adding 50% to the NET amount of DIRECT cast-iron RADIATION exclusive of mains, etc. (See paragraph 5.)
 - (a) The above 50% addition is equivalent to a deduction of $33\frac{1}{3}\%$ from listed ratings.
8. RATINGS of all boilers except those with SMOKELESS FURNACES are based on ANTHRACITE COAL as fuel.
 - (a) If BITUMINOUS COAL is to be used with boilers that are rated for ANTHRACITE COAL, it is good practice to add about 10% to size of boiler.
9. RATINGS of SMITH BOILERS with SMOKELESS FURNACES are based on bituminous coal as fuel.

No. 24 Mills Water Tube Boiler



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No. 24 Steam Boiler

COMMERCIAL RATINGS

Number of Sections	Nominal Size of Fire Pot inches	Fire (Heating) Surface sq. ft.	Steam	Water
			Rating* feet	Rating* feet
5	24 x 24	75.5	900	1500
6	24 x 30	91.0	1125	1875
7	24 x 36	106.5	1350	2250
8	24 x 42	122.0	1575	2600
9	24 x 48	137.5	1800	2975
10	24 x 54	153.0	2025	3350

Total height 66 in.

Total width Steam Boiler 45 in.

Height of Water Line 47 in.

Total width Water Boiler 48 in.

* FOR COMPUTING SIZE OF BOILER, SEE PAGE 4.

No. 24 Mills Boilers

NO. 24 MILLS WATER TUBE BOILER

Maximum Allowable Working Pressure—Steam 15 lb., Water 50 lb.
Tested to A.S.M.E. Standard Hydrostatic Pressure

DIMENSIONS

Number of Sections	Nominal Size of Fire Pot inches	Total Length of Boiler inches	Length of Fire Pot inches	Length at Foundation inches	Diam. Smoke Pipe Opening inches
5	24 x 24	48	24	32	9
6	24 x 30	54	30	38	9
7	24 x 36	60	36	44	10
8	24 x 42	66	42	50	10
9	24 x 48	72	48	56	12
10	24 x 54	78	54	62	12

Width at Foundation	29 in.
Width of Sections	32 in.
Width of Boiler, STEAM	45 in.
Width of Boiler, WATER	48 in.
Height of Boiler	66 in.
Height of Water Line	47 in.
Height of Ash Pit	12 in.
Length of Grate Bars	20 in.
Distance between Center of Grates	6 in.
Outside Diameter of Supply Drum	6 in.
Outside Diameter of Return Drums, STEAM	4½ in.
Outside Diameter of Return Drums, WATER	6 in.
Size of Supply Drum Nipples	1½ in. x 4½ in.
Size of Return Drum Nipples	1½ in. x 6 in.
Distance from floor to underside of Smoke-Pipe	19 in.

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SAFETY VALVE AND WATER RELIEF VALVE SIZES
A S.M.E. Standard

Number of Sections in Boiler	Size of Grate inches	Area of Grate sq. ft.	Working Pressure in lb. per sq. in.		
			0-15	0-25	25-50
			Size Steam Safety Valve, in	Size Water Relief Valves inches	
5	20 x 24	3.33	1½	1½	1¼
6	20 x 30	4.17	1½	1½	1½
7	20 x 36	5.00	2	2	1½
8	20 x 42	5.84	2	2	2
9	20 x 48	6.67	2	2	2
10	20 x 54	7.50	2	2	2

RECOMMENDED CHIMNEY SIZES

Number of Sections in Boiler	For small sizes of coal or for deep beds of fuel, the higher chimneys are required.					
	Diam inches	Height feet	Diam inches	Height feet	Diam inches	Height feet
5	11	75	12	50	13	25
6	11	75	12	50	14	25
7	12	75	13	50	15	25
8	13	75	14	50	15	30
9	13	75	14	50	16	30
10	14	75	15	50	16	30

NO. 24 MILLS WATER TUBE BOILER
REGULAR TAPPINGS *

SUPPLY DRUM

Outside diameter.....6 in.
Tapped for 1½ in. Lock-Nut Nipples
Ends tapped.....2½ in.

RETURN DRUMS

STEAM BOILERS:
Outside Diameter.....4½ in.
Tapped for 1½ in. Lock-Nut Nipples
Top and bottom at opposite ends tapped.....2 in.
Ends tapped.....2½ in.
Side tapped.....1¼ in.

TAPPINGS ON TOP

Number of Sections	Size of Tappings, in	No. of Tappings			
		1¼	1½	2	2½
Ste'm	Wat'r				
5	6	1	2	1	1
6	7	1	2	1	1
7	8	1	2	1	1
8	9	1	1	1	1
9	10	1	1	1	1
10		1	1	1	1

WATER BOILERS:
Outside diameter 6 in.
Tapped for 1½ in. Lock-Nut Nipples
Top and bottom at opposite ends tapped.....2 in.
Side tapped.....1¼ in.
Front ends tapped.....2½ in.
5 to 8 sections:
Rear ends tapped.....4 in.
9 and 10 sections:
Rear ends tapped.....5 in.

FIRE TOOLS FURNISHED

Ash shovel, poker, flue brush and handle.

TRIMMINGS FURNISHED FOR STEAM BOILERS

Steam gauge with cock.

Water column complete, including two ¾ in. gauge cocks, with pair of ¾ in. water-gauge cocks and glass. Damper regulator complete with chain.

Pipe and fittings for connecting steam trimmings.

ASBESTOS PLASTER

Plaster is furnished in order that the joints between the sections can be made and the boiler fired before covering the boiler complete. A sufficient amount of plaster is furnished for this purpose only.

DRAFT DISTRIBUTERS

The draft distributors in the side flues under average conditions should be turned to horizontal positions (flat across flues). In this position they do not diminish the area of the flues. If boiler is connected to a poor chimney, turn draft distributors to vertical positions.

* TAPPINGS other than those listed are SPECIAL. Order must SPECIFY SIZES.

No. 34 Mills Water Tube Boiler



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No. 34 Water Boiler

COMMERCIAL RATINGS

Number of Sections	Nominal Size of Fire pot inches	Fire (Heating) Surface sq. ft.	Steam	Water
			Rating * feet	Rating * feet
6	34 x 30	165.0	2000	3300
7	34 x 36	192.5	2400	3950
8	34 x 42	220.0	2800	4625
9	34 x 48	247.5	3200	5275
10	34 x 54	275.0	3600	5950
11	34 x 60	302.5	4000	6600
12	34 x 66	330.0	4400	7250
13	34 x 72	357.5	4800	7925
14	34 x 78	385.0	5200	8575

Total Height 78 in.

Total Width 51 in.

Height of Water Line 54 in.

* FOR COMPUTING SIZE OF BOILER, SEE PAGE 4.

NO. 34 MILLS WATER TUBE BOILER

Maximum Allowable Working Pressure—Steam 15 lb., Water 50 lb.
Tested to A S. M. E. Standard Hydrostatic Pressure.

DIMENSIONS

Number of Sections	Nominal Size of Fire Pot inches	Total Length of Boiler inches	Length of Fire Pot inches	Length at Fnd'tn inches	Size of Smoke Pipe Opening inches
6	34 x 30	60	30	37	10 x 14 = 12 Round
7	34 x 36	66	36	43	10 x 14 = 12 "
8	34 x 42	72	42	49	10 x 14 = 12 "
9	34 x 48	78	48	55	10 x 18 = 14 "
10	34 x 54	84	54	61	10 x 18 = 14 "
11	34 x 60	90	60	67	10 x 18 = 14 "
12	34 x 66	96	66	73	12 x 20 = 16 "
13	34 x 72	102	72	79	12 x 20 = 16 "
14	34 x 78	108	78	85	12 x 20 = 16 "

Width at Foundation.....	36	in.
Width of Boiler.....	51	in.
Height of Boiler.....	78	in.
Height of Water Line.....	54	in.
Height of Ash Pit.....	16	in.
Length of Grate Bars.....	28	in.
Distance between Center of Grates.....	6	in.
Outside Diameter of Supply Drum.....	8	in.
Outside Diameter of Return Drums, STEAM.....	4½	in.
Outside Diameter of Return Drums, WATER.....	6	in.
Size of Supply Drum Nipples.....	2 in. x 4½	in.
Size of Return Drum Nipples.....	1½ in. x 7	in.
Distance from floor to Smoke-Pipe Opening.....	42	in.

RECOMMENDED CHIMNEY SIZES

Number of Sections in Boiler	For small sizes of coal or for deep beds of fuel, the higher chimneys are required.					
	Diam. inches	Height feet	Diam. inches	Height feet	Diam. inches	Height feet
6	14	75	15	50	16	30
7	15	80	16	50	17	30
8	15	80	17	50	19	30
9	16	80	18	50	20	30
10	17	80	18	60	20	35
11	17	90	18	65	20	40
12	18	90	19	65	21	40
13	19	90	20	65	22	40
14	19	90	20	65	23	40

SAFETY VALVE AND WATER RELIEF VALVE SIZES
A S M E. Standard

Number of Sections in Boiler	Size of Grate inches	Area of Grate sq. ft.	Working Pressure in lb. per sq. in.		
			0-15		25-50
			Size Steam Safety Valve, in.	Size Water Relief Valves inches	
6	28 x 30	5.83	2	2	2
7	28 x 36	7.00	2	2	2
8	28 x 42	8.17	2½	2½	2
9	28 x 48	9.33	2½	2½	2
10	28 x 54	10.50	2½	2½	2½
11	28 x 60	11.67	2½	2½	2½
12	28 x 66	12.83	3	3	2½
13	28 x 72	14.00	3	3	2½
14	28 x 78	15.17	3	3	3

NO. 34 MILLS WATER TUBE BOILER

REGULAR TAPPINGS*

SUPPLY DRUM

Outside diameter.....8 in.
Tapped for 2 in. Lock-Nut Nipples
Each end tapped.....2½ in.

TAPPINGS ON TOP

Number of Sections	Size of Tappings, in.	No. of Tappings				
		2	2½	3	4	5
Ste'm	Wat'r					
6	6	1	.	2	1	.
7	7	1	.	2	1	.
8	8	1	.	2	1	.
9	9	.	1	1	1	1
10	10	.	1	1	1	1
11	11	.	1	1	1	1
12	12	.	1	1	1	1
13	13	.	.	1	2	1
14	14	.	.	1	2	1

RETURN DRUMS

STEAM BOILERS:

Outside diameter... 4½ in.
Tapped for 1½ in. Lock-Nut
Nipples
Side tapped.....2 in.
Under side tapped.....1¼ in.
6-10 sections:
Each end tapped.....2½ in.
11-14 sections:
Front ends tapped.....2½ in.
Rear ends tapped.....3 in.

WATER BOILERS:

Outside diameter.....6 in.
Tapped for 1½ in. Lock-Nut
Nipples
Under side tapped.....1¼ in.
6-8 sections:
Front ends tapped.....2½ in.
Rear ends tapped.....4 in.
Side tapped.....2 in.
9-12 sections:
Front ends tapped.....2½ in.
Rear ends tapped.....5 in.
Side tapped.....2 in.
13 and 14 sections:
Front ends tapped, one 2½,
one 5 in.
Rear ends tapped, one 2½, one
5 in.
Side tapped, one 4, one 2 in.

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FIRE TOOLS FURNISHED

Ash shovel, poker, fue brush and
handle.

TRIMMINGS FURNISHED FOR STEAM BOILERS

Steam gauge with cock. Water column complete, including two
¾ in. gauge cocks, with pair ¾ in. water gauge cocks and glass.
Damper regulator complete with chain. Pipe and fittings for connect-
ing steam trimmings.

ASBESTOS PLASTER

Plaster is furnished in order that the joints between the sections
can be made and the rear of the extreme back section covered so
that the boiler may be fired before covering the boiler complete.

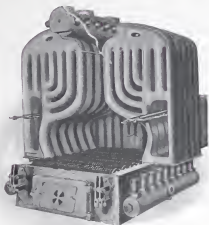
At the base of each section, and forming the sides of the fire pot,
are pockets which are to be filled with asbestos plaster. These pockets
should be filled as the sections are placed in position. A sufficient
amount of the plaster is furnished for these purposes only.

DRAFT DISTRIBUTERS

The draft distributors in the side flues, under average conditions,
should be turned to horizontal positions (flat across flues). In this
position they do not diminish the area of the flues. If boiler is con-
nected to a poor chimney, turn draft distributors to vertical positions.

* TAPPINGS other than those listed are SPECIAL. Order must
SPECIFY SIZES.

No. 44 Mills Water Tube Boiler



Interior

No. 44 Boiler

COMMERCIAL RATINGS

Number of Sections	Nominal Size of Fire Pot inches	Fire (Heating) Surface sq. ft.	Steam	Water
			Rating* feet	Rating* feet
7	44 x 36	287	3600	5950
8	44 x 42	328	4200	6925
9	44 x 48	369	4800	7925
10	44 x 54	410	5400	8900
11	44 x 60	451	6000	9900
12	44 x 66	492	6600	10900
13	44 x 72	533	7200	11875
14	44 x 78	574	7800	12875
15	44 x 84	615	8400	13850
16	44 x 90	656	9000	14850

Total Height, 75 in.

Total Width, 64 in.

Height of Water Line 58 in.

* FOR COMPUTING SIZE OF BOILER SEE PAGE 4.

No. 44 Mills Boilers

NO. 44 MILLS WATER TUBE BOILER

Maximum Allowable Working Pressure—Steam 15 lb., Water 50 lb.

Tested to A.S.M.E. Standard Hydrostatic Pressure

DIMENSIONS

Number of Sections	Nominal Size of Fire Pot inches	Total Length of Boiler inches	Length of Fire Pot inches	Length at Fnd'tn inches	Size of Smoke Pipe, Opening	
					inches	
7	44 x 36	72	36	43	13x16 $\frac{3}{4}$ = 15 round	
8	44 x 42	78	42	49	13x16 $\frac{3}{4}$ = 15 "	
9	44 x 48	84	48	55	13x16 $\frac{3}{4}$ = 15 "	
10	44 x 54	90	54	61	13x22 $\frac{3}{4}$ = 18 "	
11	44 x 60	96	60	67	13x22 $\frac{3}{4}$ = 18 "	
12	44 x 66	102	66	73	13x22 $\frac{3}{4}$ = 18 "	
13	44 x 72	108	72	79	15x24 $\frac{1}{2}$ = 20 "	
14	44 x 78	114	78	85	15x24 $\frac{1}{2}$ = 20 "	
15	44 x 84	120	84	91	15x24 $\frac{1}{2}$ = 20 "	
16	44 x 90	126	90	97	15x24 $\frac{1}{2}$ = 20 "	

Width at Foundation 46 in. Height of Ash Pit... 16 in.
 Width of Boiler.....64 in. Length of Grate Bar.....38 in.
 Height of Boiler... 75 in. Size of Supply Drum Nipples 2in. x 4 $\frac{1}{2}$ in.
 Height of Water Line 58 in. Size of Return Drum Nipples 2 in. x 7 in.
 Distance between Center of Grates..... 6 in.
 Outside Diameter of Supply Drum.....10 in.
 Outside Diameter of Return Drums, STEAM..... 6 in.
 Outside Diameter of Return Drums, WATER..... 8 in.
 Distance from floor to Smoke-Pipe Opening.....50 in.

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SAFETY VALVE AND WATER RELIEF VALVE SIZES
 A.S.M.E Standard

Number of Sections in Boiler	Size of Grate inches	Area of Grate sq. ft.	Working Pressure in lb. per sq. in.		
			0-15	0-25	25-30
			Size Steam Safety Valve in	Size Water Relief Valves inches	
7	38 x 36	9.50	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2
8	38 x 42	11.10	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$
9	38 x 48	12.70	3	3	2 $\frac{1}{2}$
10	38 x 54	14.25	3	3	2 $\frac{1}{2}$
11	38 x 60	15.80	3	3	3
12	38 x 66	17.40	3	3	3
13	38 x 72	19.00	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3
14	38 x 78	20.60	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3
15	38 x 84	22.20	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$
16	38 x 90	23.75	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$

RECOMMENDED CHIMNEY SIZES

Number of Sections in Boiler	For small sizes of coal or for deep beds of fuel, the higher chimneys are required.					
	Diam inches	Height feet	Diam. inches	Height feet	Diam. inches	Height feet
7	17	75	18	55	20	35
8	18	75	20	45	21	35
9	19	80	20	60	21	45
10	20	75	21	55	23	40
11	20	90	21	70	24	40
12	21	85	22	70	24	45
13	21	100	23	65	25	45
14	22	100	24	60	26	45
15	23	90	24	70	26	45
16	23	100	25	65	27	45

NO. 44 MILLS WATER TUBE BOILER

REGULAR TAPPINGS *

SUPPLY DRUM

Outside diameter.....10 in.
Tapped for 2 in. Lock-Nut Nipples
Front end tapped.....2½ in.
Rear end tapped, one 2½ in. and
one 2 in.

TAPPINGS ON TOP

Num- ber of Secs.	Size of Tappings, inches						
	2½	3	3½	4	5	6	7
	Number of Tappings						
7	1	1		1	1		
8	1	1		1	1		
9		1		1	1	1	
10		1		1	1	1	
11		1		1	1	1	
12		1			1	1	1
13			1		1	1	1
14			1		1	1	1
15			1		1	1	1
16			1		1	1	1

RETURN DRUMS

STEAM BOILERS:
Outside diameter.....6 in.
Tapped for 2 in. Lock-Nut Nip-
ples
Front ends tapped.....2½ in.
Sides tapped.....2 in.
Under side tapped.....1½ in.
Rear ends tapped:
7 and 8 sections.....2½ in.
9 to 16 sections.....3 in.

WATER BOILERS:
Outside diameter.....8 in.
Tapped for 2 in. Lock-Nut Nip-
ples
7 to 11 sections:
Front ends tapped, one 2½,
one 5 in.
Rear ends tapped, one 2½, one
5 in.
Side tapped.....5 in.
12 to 16 sections:
Front ends tapped, one 2½,
one 6 in.
Rear ends tapped, one 2½, one
6 in.
Side tapped.....6 in.

FIRE TOOLS FURNISHED

Ash shovel, hoe, poker, flue brush and handle.

TRIMMINGS FURNISHED FOR STEAM BOILERS

Steam gauge with cock. Water column complete, including two
¾ in. gauge cocks, with pair of ¾ in. water-gauge cocks and glass.
Damper Regulator complete with chain. Pipe and fittings for con-
necting steam trimmings.

ASBESTOS PLASTER

Plaster is furnished in order that the joints between the sections can
be made and the rear of the extreme back section covered so that the
boiler may be fired before covering the boiler complete.

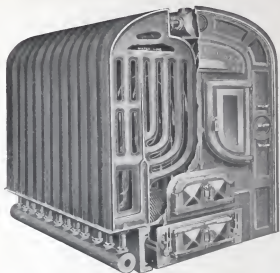
At the base of each section, and forming the sides of the fire pot,
are pockets which are to be filled with asbestos plaster. These pockets
should be filled as the sections are placed in position. A sufficient
amount of the plaster is furnished for these purposes only.

DRAFT DISTRIBUTERS

The draft distributors in the side flues, under average conditions,
should be turned to horizontal positions (flat across flues). In this
position they do not diminish the area of the flues. If boiler is con-
nected to a poor chimney, turn draft distributors to vertical positions.

* TAPPINGS other than those listed are SPECIAL. Order must
SPECIFY SIZES.

No. 48 Mills Water Tube Boiler



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No. 48 Boiler

COMMERCIAL RATINGS

Number of Sections	Nominal Size of Fire Pot inches	Fire (Heating) Surface sq. ft.	Steam Rating* feet	Water Rating* feet
7	48 x 30	360	4800	7925
8	48 x 36	420	5600	9250
9	48 x 42	480	6400	10550
10	48 x 48	540	7200	11875
11	48 x 54	600	8000	13200
12	48 x 60	660	8800	14525
13	48 x 66	720	9600	15850
14	48 x 72	780	10400	17150
15	48 x 78	840	11200	18475
16	48 x 84	900	12000	19800
17	48 x 72	960	12800	21125
17	48 x 90†	960	12800	21125
18	48 x 78	1020	13600	22450
18	48 x 96†	1020	13600	22450

Total Height, 103 in.

Total Width, 84 in.

Height of Water Line 84 in.

*FOR COMPUTING SIZE OF BOILER, SEE PAGE 4

† Maximum size of fire pot, not shipped as regular.

NO. 48 MILLS WATER TUBE BOILER

Maximum Allowable Working Pressure—Steam 15 lb., Water 80 lb.
Tested to A.S.M.E. Standard Hydrostatic Pressure

DIMENSIONS

Number of Sections	Nominal Size of Fire Pot inches	Total Length Boiler inches	Length of Fire Pot inches	Length at Fnd'tn inches	Size of Smoke Pipe, Opening inches
7	48 x 30	74	30	43	16 round
8	48 x 36	80	36	49	16 "
9	48 x 42	86	42	55	16 "
10	48 x 48	92	48	61	16 "
11	48 x 54	98	54	67	16x23 $\frac{3}{4}$ = 20 round
12	48 x 60	104	60	73	16x23 $\frac{3}{4}$ = 20 "
13	48 x 66	110	66	79	16x23 $\frac{3}{4}$ = 20 "
14	48 x 72	116	72	85	16x23 $\frac{3}{4}$ = 20 "
15	48 x 78	122	78	91	16x23 $\frac{3}{4}$ = 20 "
16	48 x 84	128	84	97	16x31 $\frac{1}{2}$ = 24 "
17	48 x 72	134	72	103	16x31 $\frac{1}{2}$ = 24 "
17	48 x 90*	134	90	103	16x31 $\frac{1}{2}$ = 24 "
18	48 x 78	140	78	109	16x31 $\frac{1}{2}$ = 24 "
18	48 x 96*	140	96	109	16x31 $\frac{1}{2}$ = 24 "

Width of Ash Pit.....	60 in.	15
Width of Twin Sections.....	82 $\frac{1}{2}$ in.	
Width of Boiler.....	84 in.	
Height of Boiler.....	103 in.	
Height of Water Line.....	84 in.	
Height of Ash Pit.....	18 in.	
Length of Grate Bar.....	48 in.	
Distance between Center of Grates.....	6 in.	
Outside Diameter Supply Drum.....	12 in.	
Outside Diameter Return Drums.....	8 in.	
Size of Supply Drum Nipples.....	2 in. x 6 in.	
Size of Return Drum Nipples.....	2 in. x 9 in.	
Distance from floor to Smoke Pipe Opening.....	58 in.	

RECOMMENDED CHIMNEY SIZES

Number of Sections in Boiler	For small sizes of coal or for deep beds of fuel, the higher chimneys are required					
	Diam. inches	Height feet	Diam. inches	Height feet	Diam. inches	Height feet
7	19	80	20	60	22	40
8	20	80	21	60	23	40
9	21	80	23	60	24	40
10	22	80	24	60	26	40
11	23	90	24	65	27	40
12	23	90	25	65	27	45
13	24	90	25	75	27	50
14	25	100	26	75	29	50
15	26	100	27	75	29	50
16	26	100	28	75	30	50
17	27	100	28	80	31	50
18	28	100	29	80	32	50

* Maximum size of Fire Pot, not shipped as regular.

**NO. 48 MILLS WATER TUBE BOILER
SAFETY VALVE AND WATER RELIEF VALVE SIZES
A. S. M. E. Standard**

Number of Sections in Boiler	Size of Grate inches	Area of Grate sq. ft.	Working Pressure in lb. per sq. in.			
			0-15	0-25	25-50	50-80
			Size Steam Safety Valve, inches	Size Water Relief Valves inches		
7	48 x 30	10	2½	2½	2½	2
8	48 x 36	12	2½	2½	2½	2½
9	48 x 42	14	3	3	2½	2½
10	48 x 48	16	3	3	3	2½
11	48 x 54	18	3½	3½	3	3
12	48 x 60	20	3½	3½	3	3
13	48 x 66	22	3½	3½	3½	3
14	48 x 72	24	3½	3½	3½	3
15	48 x 78	26	4	4	3½	3½
16	48 x 84	28	4	4	3½	3½
17*	48 x 72*	24	3½	3½	3½	3
17	48 x 78	26	4	4	3½	3½
17	48 x 90	30	4	4	4	3½
18*	48 x 78*	26	4	4	3½	3½
18	48 x 84	28	4	4	3½	3½

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REGULAR TAPPINGS **

TAPPINGS ON TOP OF SUPPLY DRUM

Number of Secs.	Size of Tappings, inches					
	2½	3	3½	4	6	8
	Number of Tappings					
7	1	1	.	.	2	.
8	1	1	.	.	2	.
9	.	2	.	.	1	1
10	.	2	.	.	1	1
11	.	.	2	.	.	2
12	.	.	2	.	.	2
13	.	.	2	.	.	2
14	.	.	.	2	.	2
15	.	.	.	2	.	2
16	.	.	.	2	.	2
17	.	.	.	2	.	2
18	.	.	.	2	.	2

SUPPLY DRUM

Outside diameter, 12 in.
Tapped for 2 in. Lock-Nut Nipples
Rear end tapped, one 4 in and one 2 in.
For tappings on top of drum, see table at left.

RETURN DRUMS †

Outside diameter, 8 in.
Tapped for 2 in. Lock-Nut Nipples
Rear ends tapped, 4 in.
Undersides tapped, 1½ in.

FIRE TOOLS FURNISHED

Ash shovel, hoc, poker, flue brush and handle.

TRIMMINGS FURNISHED FOR STEAM BOILERS

Steam gauge with cock and syphon. Water column complete, including three ¾ in. gauge cocks, ¾ in. water-gauge cocks and glass. Damper regulator complete with chain. Steam jet and hose.

ASBESTOS PLASTER

Plaster is furnished in order that the joints between sections can be made and the rear of the extreme back section covered so that the boiler may be fired before covering the boiler complete.

At the base of each section, and forming the sides of the fire pot, are pockets which are to be filled with asbestos plaster. These pockets should be filled as the sections are placed in position. A sufficient amount of the plaster is furnished for these purposes only.

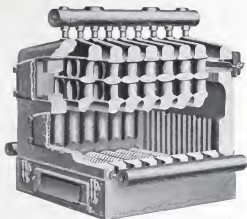
* Size of grate shipped unless otherwise specified.

** Tappings other than those listed are special. Order must specify sizes.

† When Boiler is to be used for water heating, specify on order the size of supply and return pipe tappings

No. 27 Smith Boiler

without
Smokeless Furnace



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Nos. 27 and 36 Smith Boiler without Smokeless Furnace

COMMERCIAL RATINGS FOR BOILERS WITHOUT SMOKELESS FURNACE

Number of Sections in Boiler	Nominal Size of Fire Pot inches	Fire (Heating) Surface sq. ft.	Steam	Water
			Rating* feet	Rating * feet
5	27 x 24	67.5	1200	1975
6	27 x 30	81.5	1500	2475
7	27 x 36	95.5	1800	2975
8	27 x 42	109.5	2100	3475
9	27 x 48	123.5	2400	3950
10	27 x 54	137.5	2700	4450
11	27 x 60	151.5	3000	4950
12	27 x 60	172.5	3300	5450
12	27 x 66†	165.5	3300	5450
13	27 x 66	186.5	3600	5950
13	27 x 72†	179.5	3600	5950
14	27 x 66	200.5	3900	6425
14	27 x 78†	193.5	3900	6425

Total height 80 in.
Height of Water Line 57 in.

Total width, Steam Boiler 56 in.
Total width, Water Boiler 59 in.

* FOR COMPUTING SIZE OF BOILER SEE PAGE 4.

† Maximum size of Fire Pot, not shipped as regular.

No. 27 Smith Boilers

NO. 27 SMITH BOILER
WITHOUT
SMOKELESS FURNACE

Maximum Allowable Working Pressure—Steam 15 lb., Water 30 lb.
Tested at 60 lb. per sq. in. Hydrostatic Pressure, A.S.M.E. Standard

DIMENSIONS

Number of Sections in Boiler	Size of Fire Pot	Total Length of Boiler inches	Length at Foundation inches	Length of Fire Pot inches	Size of Smoke Pipe Opening inches
	inches				
5	27 x 24	47	32	24	12 x 15 oval equals 13¼ round
6	27 x 30	53	38	30	
7	27 x 36	59	44	36	
8	27 x 42	65	50	42	
9	27 x 48	71	56	48	
10	27 x 54	77	62	54	
11	27 x 60	83	68	60	
12	27 x 60	89	74	60	
12	27 x 66*	89	74	66	
13	27 x 66	95	80	66	
13	27 x 72*	95	80	72	
14	27 x 66	101	86	66	
14	27 x 78*	101	86	78	

- 18 Width at foundation... .35 in. Dist. betw. centers of grate bars 6 in.
Width of boiler, steam .56 in. Outside diameter supply drum 8 in.
Width of boiler, water .59 in. Outside dia. ret. drum, steam .4½ in.
Height of boiler.....80 in. Outside dia. ret. drum, water .6 in.
Height of water line....57 in. Size of supply drum nipples 2 in. x 6 in.
Height of ash pit.....16 in. Size ret. drum nipples, 1½ in. x 6 in.
Length of grate bar.....27 in. Distance from floor to center of smoke pipe opening.....55 in.

SAFETY AND WATER RELIEF VALVE SIZES
A.S.M.E. Standard

Number of Sections in Boiler	Size of Grate inches	Area of Grate sq. ft.	Working Pressure in lb. per sq. in.		
			0-15	0-25	25-30
			Size Steam Safety Valve, inches	Size Water Relief Valves inches	
5	27 x 24	4.50	1½	1½	1½
6	27 x 30	5.63	2	2	2
7	27 x 36	6.75	2	2	2
8	27 x 42	7.88	2	2	2
9	27 x 48	9.00	2½	2½	2
10	27 x 54	10.13	2½	2½	2½
11	27 x 60	11.25	2½	2½	2½
12†	27 x 60†	11.25	2½	2½	2½
12	27 x 66	12.38	2½	2½	2½
13†	27 x 66†	12.38	2½	2½	2½
13	27 x 72	13.50	3	3	2½
14†	27 x 66†	12.38	2½	2½	2½
14	27 x 72	13.50	3	3	2½
14	27 x 78	14.63	3	3	2½

* Maximum size of Fire Pot; not shipped as regular.

† Size of Grate shipped unless otherwise specified.

NO. 27 SMITH BOILER
WITHOUT
SMOKELESS FURNACE
REGULAR TAPPINGS*

SUPPLY DRUM

Outside diameter.....8 in.
Each end tapped.....2½ in.
Tapped for 2 in. Lock-Nut Nipples

NUMBER OF TAPPINGS ON TOP OF DRUM

Number of Boiler Sections	Size of Tappings in Inches					
		2	2½	3	4	5
Ste'm	Wat'r					
5	6	1		2	1	
6	7	1		2	1	
7	8	1		2	1	
8	9		1	1	1	1
9	10		1	1	1	1
10	11		1	1	1	1
11	12		1	1	1	1
12	13			1	2	1
13	14			1	2	1
14				1	2	1

RETURN DRUMS

STEAM BOILERS:

Outside diameter.....4½ in.
Tapped for 1½ in. Lock-Nut Nipples

Top and bottom at opposite ends tapped.....2 in.

Sides tapped.....1¼ in.

Front ends tapped.....2½ in.

Rear ends tapped:

5 to 10 sections.....2½ in.

11 to 14 sections.....3 in.

WATER BOILERS:

Outside diameter.....6 in.

Tapped for 1½ in. Lock-Nut Nipples

Tapped underside.....2 in.

Sides tapped.....1¼ in.

Front ends tapped.....2½ in.

Rear ends tapped:

5 to 8 sections.....4 in.

9 to 12 sections.....5 in.

13 and 14 sections, one 2½ in

and one 5 in.

Top tapped:

5 to 12 sections.....2 in.

13 and 14 sections, one 2 in.

and one 4 in.

RECOMMENDED CHIMNEY SIZES

Number of Sections in Boiler	For small sizes of coal or for deep beds of fuel, the higher chimneys are required.					
	Diameter		Height		Diameter	
	inches	feet	inches	feet	inches	feet
5	12	75	13	50	13	35
6	12	75	13	50	14	35
7	13	75	14	50	15	35
8	14	75	15	50	16	35
9	15	75	16	50	17	40
10	15	80	16	60	17	40
11	16	80	17	60	18	40
12	16	100	17	75	18	50
13	16	100	17	75	18	50
14	17	100	18	75	19	50

FIRE TOOLS FURNISHED

Ash shovel, flue brush with handle, hoe and poker.

ASBESTOS PLASTER

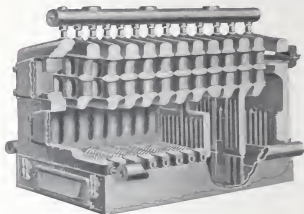
Plaster is furnished that the joints between the sections can be made and the boiler fired before covering the boiler complete. A sufficient amount of plaster is furnished for this purpose only.

TRIMMINGS FURNISHED WITH STEAM BOILERS

Water column, gauge cocks, water-gauge cocks, water-gauge glass, steam gauge (with cock), steam gauge siphon. Damper regulator complete with chain. Pipe and fittings for connecting steam trimmings.

* TAPPINGS other than those listed are SPECIAL. Order must SPECIFY SIZES.

No. 27 Smith Boiler
with
Smokeless Furnace for Bituminous Coal
Patent Applied For



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Nos. 27 and 36 Smith Boiler with Smokeless Furnace

COMMERCIAL RATINGS
FOR BITUMINOUS COAL

Number of Sections in Boiler	Nominal Size of Fire Pot* inches	Fire (Heating) Surface Sq. ft.	Steam	Water
			Rating† feet	Rating† feet
10	27 x 30	152	1500	2175
11	27 x 30	166	1650	2725
11	27 x 36	166	1800	2975
12	27 x 36	180	1950	3225
12	27 x 42	180	2100	3475
13	27 x 42	194	2250	3725
13	27 x 48	194	2400	3950
14	27 x 48	208	2550	4200
15	27 x 54	222	2725	4500
16	27 x 60	236	2900	4775

Total height, 80 in.
Height of Water Line, 57 in.

Total width, Steam Boiler, 56 in.
Total width, Water Boiler, 59 in.

* State which size of fire pot is desired.

† FOR COMPUTING SIZE OF BOILER SEE PAGE 4.

NO. 27 SMITH BOILER
WITH
SMOKELESS FURNACE FOR BITUMINOUS COAL

Maximum Allowable Working Pressure—Steam 15 lb., Water 30 lb.
Tested at 60 lb. per sq. in. Hydrostatic Pressure. A. S. M. E. Standard

DIMENSIONS

Number of Sections in Boiler	Nominal Size of Fire Pot* inches	Total Length of Boiler inches	Length at Foundation inches	Length of Fire Pot inches	Size of Smoke Pipe Opening inches
10	27 x 30	77	62	30	
11	27 x 30	83	68	30	
11†	27 x 36†	83	68	36	12 x 15 oval equals
12	27 x 36	89	74	36	
12†	27 x 42†	89	74	42	
13	27 x 42	95	80	42	13½ round
13†	27 x 48†	95	80	48	
14	27 x 48	101	86	48	
15	27 x 54	107	92	54	
16	27 x 60	113	98	60	

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Width at foundation...35 in.	Dist. betw center of Grates . . . 6 in.
Width of boiler, steam 56 in.	Outside diam. of supply drum. . . 8 in.
Width of boiler water 59 in.	Outside diam. of return drum steam 4½ in.
Height of boiler.80 in.	Outside diam. of return drum wtr 6 in.
Height of water line . . .57 in.	Size of supply drum nipples 2 in. x 6 in.
Height of ash pit.16 in.	Size of return drum nipples 1½ in. x 6 in.
Length of grate bar.27 in.	Distance from floor to center of smoke pipe opening55 in.

SAFETY AND WATER RELIEF VALVE SIZES

A. S. M. E. Standard

Number of Sections in Boiler	Size of Grate inches	Area of Grate sq. ft.	Working Pressure in lb. per sq. in.		
			0-15	0-25	25-30
			Size Steam Safety Valve, in.	Size Water Relief Valves inches	
10	27 x 30	5.63	2	2	2
11	27 x 30	5.63	2	2	2
11†	27 x 36†	6.75	2	2	2
12	27 x 36	6.75	2	2	2
12†	27 x 42†	7.88	2	2	2
13	27 x 42	7.88	2	2	2
13†	27 x 48†	9.00	2½	2½	2
14	27 x 48	9.00	2½	2½	2
15	27 x 54	10.13	2½	2½	2½
16	27 x 60	11.25	2½	2½	2½

* State which size of Fire Pot is desired.

† Size of grate shipped unless otherwise specified.

No. 27 Smith Boilers

NO. 27 SMITH BOILER
WITH
SMOKELESS FURNACE FOR BITUMINOUS COAL
REGULAR TAPPINGS*

SUPPLY DRUM

Outside diameter.....8 in.
Each end tapped.....2½ in.
Tapped for 2 in. Lock-Nut Nipples.

NUMBER OF TAPPINGS ON
TOP OF DRUM

Number of Boiler Sections		Size of Tappings in inches			
Ste'm	Wat'r	2½	3	4	5
10	10	1	1	1	1
10	11	1	1	1	1
11	12	1	1	1	1
12	13	.	1	2	1
13	14	.	1	2	1
14	15	.	1	2	1
15	16	.	1	2	1
16	..	.	1	2	1

RETURN DRUMS

STEAM BOILERS:

Outside diameter.....4½ in.
Tapped for 1½ in. Lock-Nut Nipples
Top and bottom at opposite ends tapped.....2 in.
Side tapped.....1¼ in.
Front ends tapped.....2½ in.
Rear ends tapped
10 section.....2½ in.
11-16 sections.....3 in.

WATER BOILERS:

Outside diameter.....6 in.
Tapped for 1½ in. Lock-Nut Nipples
Tapped underside.....2 in.
Side tapped.....1¼ in.
Front ends tapped.....2½ in.
Rear ends tapped
10-12 sections.....5 in.
13-16 sections, one 2½ in., one 5 in.
Top tapped
10-12 sections.....2 in.
13-16 sections, one 2 in., one 4 in.

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RECOMMENDED CHIMNEY SIZES

Number of Sections in Boiler	Diameter	Height	Diameter	Height	Diameter	Height
	inches	feet	inches	feet	inches	feet
10	12	80	13	60	14	40
11	13	80	14	60	15	40
11	13	80	14	60	15	40
12	13	100	14	75	15	50
12	14	100	14	75	15	50
13	14	100	15	75	16	50
13	14	100	15	80	16	60
14	14	100	15	80	16	60
15	14	110	15	90	16	75
16	15	110	15	90	16	75

FIRE TOOLS FURNISHED

Ash shovel, flue brush with handle, hoe, rake and slice bar.

TRIMMINGS FURNISHED WITH STEAM BOILERS

Water column, gauge cocks, water-gauge cocks, water-gauge glass, steam gauge (with cock), steam-gauge siphon. Damper regulator complete with chain. Pipe and fittings for connecting steam trimmings.

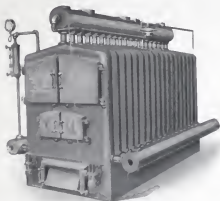
ASBESTOS PLASTER

Plaster is furnished that the joints between the sections can be made and the boiler fired before covering the boiler complete. A sufficient amount of plaster is furnished for this purpose only.

* TAPPINGS other than those listed are SPECIAL. Order must SPECIFY SIZES.

No. 36 Smith Boiler

without
Smokeless Furnace



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Nos. 27 and 36 Smith Boiler without Smokeless Furnace
COMMERCIAL RATINGS FOR BOILERS
WITHOUT SMOKELESS FURNACE

Number of Sections in Boiler	Nominal Size of Fire Pot inches	Fire (Heating) Surface Sq. ft.	Steam	Water
			Rating* feet	Rating* feet
7	36 x 36	133.5	2300	3800
8	36 x 42	153.	2800	4625
9	36 x 48	172.5	3300	5450
10	36 x 54	192.	3800	6275
11	36 x 60	211.5	4300	7100
12	36 x 60	241.	4800	7925
12	36 x 66†	231.	4800	7925
13	36 x 66	260.5	5300	8750
13	36 x 72†	250.5	5300	8750
14	36 x 66	280.	5800	9575
14	36 x 78†	270.	5800	9575
15	36 x 72	299.5	6300	10400
15	36 x 84†	289.5	6300	10400
16	36 x 72	319.	6800	11225
16	36 x 90†	309.	6800	11225

Total height, 83 in.

Height of Water Line, 59 in.

Total width, Steam Boiler, 72 in.

Total width, Water Boiler, 76 in.

† Maximum size of fire pot; not shipped as regular.

* FOR COMPUTING SIZE OF BOILER SEE PAGE 4

NO. 36 SMITH BOILER
WITHOUT
SMOKELESS FURNACE

Maximum Allowable Working Pressure—Steam 15 lb., Water 30 lb.
A.S.M.E. Standard

Tested at 60 lb. per sq. in. Hydrostatic Pressure

Number of Sections in Boiler	Size of Fire Pot inches	Total Length of Boiler inches	Length of Fire Pot inches	Length at Foundation inches	Size of Smoke Pipe Opening inches
7	36 x 36	63	36	44	
8	36 x 42	69	42	50	
9	36 x 48	75	48	56	
10	36 x 54	81	54	62	
11	36 x 60	87	60	68	12 x 20
12	36 x 60	93	60	74	oval
12	36 x 66*	93	66*	74	equals
13	36 x 66	99	66	80	17
13	36 x 72*	99	72*	80	round
14	36 x 66	105	66	86	
14	36 x 78*	105	78*	86	
15	36 x 72	111	72	92	
15	36 x 84*	111	84*	92	
16	36 x 72	117	72	98	
16	36 x 90*	117	90*	98	

Width at foundation 48 1/4 in. Dist. betw. center of Grates . . . 6 in.
 Width of boiler, steam 72 in. Outside diam. of supply drum, 10 in.
 Width of boiler, water 76 in. Outside diam. of return drums,
 steam 6 in.
 Height of boiler 83 in. Outside diam. of return drums,
 water 8 in.
 Height of water line . 59 in. Size of supply drum nipples 2 1/2 x 6 in.
 Height of ash pit . . . 16 in. Size of return drum nipples 2 x 6 in.
 Length of grate bars 35 1/4 in. Distance from floor to center of
 smoke pipe opening 57 in.

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SAFETY VALVE AND WATER RELIEF VALVE SIZES
A S M E Standard

Number of Sections in Boiler	Size of Grate inches	Area of Grate sq. ft.	Working Pressure in lb. per sq. in.		
			0-15	0-25	25-30
			Size Steam Safety Valve, in.	Size Water Relief Valves inches	
7	36 x 36	9.00	2 1/2	2 1/2	2
8	36 x 42	10.50	2 1/2	2 1/2	2 1/2
9	36 x 48	12.00	2 1/2	2 1/2	2 1/2
10	36 x 54	13.50	3	3	2 1/2
11	36 x 60	15.00	3	3	2 1/2
12†	36 x 60†	15.00	3	3	2 1/2
12	36 x 66	16.50	3	3	3
13†	36 x 66†	16.50	3	3	3
13	36 x 72	18.00	3 1/2	3 1/2	3
14†	36 x 66†	16.50	3	3	3
14	36 x 72	18.00	3 1/2	3 1/2	3
14	36 x 78	19.50	3 1/2	3 1/2	3
15†	36 x 72†	18.00	3 1/2	3 1/2	3
15	36 x 78	19.50	3 1/2	3 1/2	3
15	36 x 84	21.00	3 1/2	3 1/2	3
16†	36 x 72†	18.00	3 1/2	3 1/2	3
16	36 x 78	19.50	3 1/2	3 1/2	3
16	36 x 84	21.00	3 1/2	3 1/2	3
16	36 x 90	22.50	3 1/2	3 1/2	3 1/2

* Maximum size of Fire Pot; not shipped as regular

† Size of grate shipped unless otherwise specified.

NO. 36 SMITH BOILER
WITHOUT
SMOKELESS FURNACE
REGULAR TAPPINGS*

SUPPLY DRUM

Outside diameter..... 10 in.
Tapped for 2½ in. lock-nut nipples
Each end tapped..... 2½ in.

RETURN DRUMS

STEAM BOILERS:
Outside diameter..... 6 in.
Tapped for 2 in. Lock-Nut Nipples.
Top and bottom at opposite ends tapped 2 in.
Front ends tapped..... 2½ in.
Side tapped..... 1¼ in.
Rear ends tapped:
7 and 8 sections..... 2½ in.
9 to 16 sections 3 in.

WATER BOILERS:
Outside diameter ... 8 in.
Tapped for 2 in. Lock-Nut Nipples
Side tapped..... 1¼ in.
7 to 11 sections:
Front ends tapped, one 2½ in., one 5 in.
Rear ends tapped, one 2½ in., one 5 in.
Top tapped one 5 in.
12 to 16 sections:
Front ends tapped, one 2½ in., one 6 in.
Rear ends tapped, one 2½ in., one 6 in.
Top tapped... .. one 6 in.

TAPPINGS ON TOP

Number of Sections	Size of Tappings, in	Number of Tappings					
		2½	3	3½	4	5	6
7	7	1			3		
8	8	1			3		
9	9	1			3		
10	10	1			2	1	
11	11		1		2	1	
12	12		1		2	1	
13	13		1		2	1	
14	14		1		2	1	
15	15		1		3		
16	16		1		3		

RECOMMENDED CHIMNEY SIZES

Number of Sections in Boiler	For small sizes of coal or for deep beds of fuel, the higher chimneys are required.					
	Diam inches	Height feet	Diam. inches	Height feet	Diam. inches	Height feet
7	17	80	17	60	17	40
8	17	80	17	60	18	40
9	17	80	17	60	18	45
10	17	100	18	75	19	50
11	18	100	18	75	20	55
12	19	100	19	75	20	60
13	19	110	19	90	20	65
14	20	110	20	90	21	70
15	20	110	21	90	21	75
16	21	110	21	90	22	80

FIRE TOOLS FURNISHED

Ash shovel, flue brush with handle, hoe and poker.

TRIMMINGS FURNISHED WITH STEAM BOILERS

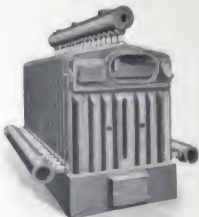
Water column, gauge cocks, water-gauge cocks, water-gauge glass, steam gauge (with cock), steam-gauge siphon. Damper regulator complete with chain. Pipe and fittings for connecting steam trimmings.

ASBESTOS PLASTER

Plaster is furnished that the joints between the sections can be made and the boiler fired before covering the boiler complete. A sufficient amount of plaster is furnished for this purpose only.

* TAPPINGS other than those listed are SPECIAL. Order must SPECIFY SIZES.

No. 36 Smith Boiler with Smokeless Furnace for Bituminous Coal Patent Applied For



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Rear View

Nos. 27 and 36, Smith Boiler with Smokeless Furnace

COMMERCIAL RATINGS FOR BITUMINOUS COAL

Number of Sections in Boiler	Size of Fire Box*	Fire Heating Surface sq. ft.	Steam	Water
			Rating† feet	Rating† feet
11	36 x 36	231	2150	4500
12	36 x 36	267	2600	4500
13	36 x 42	267	3050	5275
13	36 x 42	303	3500	5775
13	36 x 48	339	3950	6275
14	36 x 48	375	4400	6775
14	36 x 54	411	4850	7275
16	36 x 54	447	5300	7775
16	36 x 60	483	5750	8275
17	36 x 60	519	6200	8775
18	36 x 66	555	6650	9275

Total Height, 85 in.

Total Width, Steam Boiler, 72 in.

Height to Water Level, 66 in.

Total Width, Water Boiler, 76 in.

* 7 ft. diameter, size of fire box, as desired.

† FOR COMPLETE SIZE OF BOILER SEE PAGE 4

NO. 36 SMITH BOILER
WITH

SMOKELESS FURNACE FOR BITUMINOUS COAL

Maximum Allowable Working Pressure—Steam 15 lb., Water 30 lb.
Tested at 60 lb. per sq. in. Hydrostatic Pressure, A.S.M.E. Standard

DIMENSIONS

Number of Sections in Boiler	Size of Fire Pot* inches	Total Length of Boiler inches	Length of Fire Pot* inches	Length at Foundation inches	Size of Smoke Pipe Opening inches
11	36 x 36	87	36	68	
12	36 x 36	93	36	74	
12	36 x 42	93	42	74	
13	36 x 42	99	42	80	12 x 20
13	36 x 48	99	48	80	oval
14	36 x 48	105	48	86	equals
14	36 x 54	105	54	86	17
15	36 x 54	111	54	92	round
16	36 x 60	117	60	98	
17	36 x 66	123	72	104	
18	36 x 72	129	78	110	

Width at foundation 48 $\frac{1}{4}$ in. Dist. betw. center of Grates . . . 6 in.
 Width of boiler, steam 72 in. Outside diam. of supply drum . . 10 in.
 Width of boiler, water 76 in. Outside diam. return drums, steam 6 in.
 Height of boiler . . . 83 in. Outside diam. return drums, water 8 in.
 Height of water line . 59 in. Size of supply drum nipples . 2 $\frac{1}{2}$ x 6 in.
 Height of ash pit . . 16 in. Size of return drum nipples 2 x 6 in.
 Length of grate bar . 35 $\frac{1}{2}$ in. Distance from floor to center of
 smoke pipe opening 57 in.

SAFETY VALVE AND WATER RELIEF VALVE SIZES
A.S.M.E. Standard

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Number of Sections in Boiler	Size of Grate inches	Area of Grate sq. ft.	Working Pressure in lb. per sq. in.		
			0-15		25-30
			Size Steam Safety Valve, in.	Size Water Valves inches	Relief Valves inches
11	36 x 36	9.00	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2
12	36 x 36	9.00	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2
12†	36 x 42†	10.50	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$
13	36 x 42	10.50	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$
13†	36 x 48†	12.00	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$
14	36 x 48	12.00	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$
14†	36 x 54†	13.50	3	3	2 $\frac{1}{2}$
15	36 x 54	13.50	3	3	2 $\frac{1}{2}$
16	36 x 60	15.00	3	3	2 $\frac{1}{2}$
17	36 x 66	16.50	3	3	3
18	36 x 72	18.00	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3

RECOMMENDED CHIMNEY SIZES

Number of Sec. in Boiler	Diam.	Height	Diam.	Height	Diam.	Height
	inches	feet	inches	feet	inches	feet
11	17	100	17	75	17	50
12	17	100	17	75	17	50
12	17	100	17	75	18	55
13	17	100	18	80	18	60
13	18	100	18	80	18	65
14	18	110	18	90	18	70
14	18	110	18	90	18	75
15	18	110	19	90	19	75
16	19	110	19	90	20	75
17	19	110	20	90	20	75
18	19	110	20	90	21	75

* State size of Fire Pot desired.

† Size of grate shipped unless otherwise specified.

NO 36 SMITH BOILER
WITH
SMOKELESS FURNACE FOR BITUMINOUS COAL
REGULAR TAPPINGS*
SUPPLY DRUM

Outside diameter 10 in.
Tapped for 2½ in. Lock-Nut Nipples
Each end tapped. 2½ in.

TAPPINGS ON TOP OF DRUM

Number Sections		Size of Tappings, inches				
		3	3½	4	5	6
Steam	Water	Number of Tappings				
	11	1	.	2	1	.
11	12	1	.	2	.	1
12	13	1	.	.	2	1
13	14	.	1	.	2	1
14	15	.	1	.	.	3
15	16	.	1	.	.	3
16	17	.	1	.	.	3
17	18	.	1	.	.	3
18	..	.	1	.	.	3

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RETURN DRUMS

STEAM BOILERS:
 Outside diameter 6 in.
 Tapped for 2 inch Lock-Nut Nipples
 Top and bottom at opposite ends tapped 2 in.
 Front ends tapped 2½ in.
 Side tapped 1½ in.
 Rear ends tapped 3 in.

WATER BOILERS:
 Outside diameter 8 in.
 Tapped for 2 inch Lock-Nut Nipples
 Side Tapped 1¼ in.

11 Section:
 Front ends tapped, one 2½ in. one 5 in.
 Rear ends tapped, one 2½ in. one 5 in.
 Top tapped, one 5 in.

12-18 sections:
 Front ends tapped, one 2½ in. one 6 in.
 Rear ends tapped, one 2½ in. one 6 in.
 Top tapped, one 6 in.

TRIMMINGS FURNISHED WITH STEAM BOILERS

Water column, gauge cocks, water-gauge cocks, water-gauge glass, steam gauge (with cock), steam-gauge siphon. Damper regulator complete with chain. Pipe and fittings for connecting steam trimmings.

FIRE TOOLS FURNISHED

Ash shovel, fue hrush with handle, hoe, rake and slice bar.

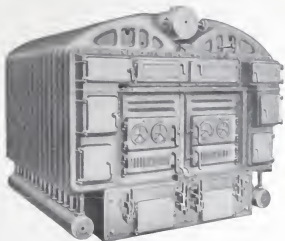
ASBESTOS PLASTER

Plaster is furnished that the joints between the sections can be made and the boiler fired before covering the boiler complete. A sufficient amount of plaster is furnished for this purpose only.

* TAPPINGS other than those listed are SPECIAL. Order must SPECIFY SIZES.

No. 60 Smith Boiler

without
Smokeless Furnace



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COMMERCIAL RATINGS FOR BOILERS
WITHOUT SMOKELESS FURNACE

Number of Sections in Boiler	Size of Fire Pot inches	Fire (Heating) Surface Sq. ft	Steam	Water
			Rating* feet	Rating* feet
8	60 x 36	314	6300	9930
9	60 x 42	352	7230	11930
10	60 x 48	390	8100	13850
11	60 x 54	424	9090	15850
12	60 x 60	462	10830	17830
13	60 x 66	500	12000	19800
14	60 x 72	538	13290	21830
15	60 x 78	576	14400	23750
16	60 x 84	610	15600	25720
17	60 x 78	673	16830	27700
17	60 x 90†	648	16830	27700
18	60 x 84	711	18300	29700
18	60 x 96†	686	18300	29700

Total Height, 87 in. Total Width, 98 in.
Height of Water Line, 66 in

† Maximum size of fire pot, not shipped as regular

*FOR COMPUTING SIZE OF BOILER SEE PAGE 4.

NO. 60 SMITH BOILER
WITHOUT
SMOKELESS FURNACE

Maximum Allowable Working Pressure—Steam 15 lb., Water 30 lb.
A.S.M.E. Standard
Tested at 60 lb. per sq. in. Hydrostatic Pressure

DIMENSIONS

Number of Sections in Boiler	Size of Fire Pot inches	Total Length of Boiler inches	Length of Fire Pot inches	Length at Foundation inches	Size of Smoke Pipe Opening inches
8	60 x 36	86	36	49	
9	60 x 42	92	42	55	
10	60 x 48	98	48	61	
11	60 x 54	104	54	67	16 x 37
12	60 x 60	110	60	73	oval
13	60 x 66	116	66	79	equals in
14	60 x 72	122	72	85	area 26
15	60 x 78	128	78	91	round,
16	60 x 84	134	84	97	in circum-
					ference
					29½
17	60 x 78	140	78	103	round
17	60 x 90*	140	90*	103	
18	60 x 84	146	84	109	
18	60 x 96*	146	96*	109	

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Width at foundation .72 in. Dist. betw. center of Grates 6 in.
 Width of boiler 98 in. Diameter of supply drum 12 in.
 Height of boiler 87 in. Diameter of return drums 8 in.
 Height of water line 66 in. Size of supply drum nipples . 2 x 4½ in.
 Height of ash pit 18 in. Size of return drum nipples 2 x 9 in.
 Length of grate bars Distance from floor to smoke pipe
 (double) 60 in. opening 41 in.

SAFETY VALVE AND WATER RELIEF VALVE SIZES
A.S.M.E. Standard

Number of Sections in Boiler	Size of Grate inches	Area of Grate sq. ft.	Working Pressure in lb. per sq. in.		
			0-15 Size Steam Safety Valve, in.	0-25 | 25-30	
				Size Water Relief Valves inches	
8	60 x 36	15.00	3	3	2½
9	60 x 42	17.50	3	3	3
10	60 x 48	20.00	3½	3½	3
11	60 x 54	22.50	3½	3½	3½
12	60 x 60	25.00	4	4	3½
13	60 x 66	27.50	4	4	3½
14	60 x 60	25.00	4	4	3½
14†	60 x 72†	30.00	4	4	4
15	60 x 60	25.00	4	4	3½
15	60 x 66	27.50	4	4	3½
15†	60 x 78†	32.50	4½†	4½†	4
16	60 x 66	27.50	4	4	3½
16	60 x 72	30.00	4	4	4
16†	60 x 84†	35.00	4½†	4½†	4
17	60 x 72	30.00	4	4	4
17†	60 x 78†	32.50	4½†	4½†	4
17	60 x 90	37.50	4½†	4½†	4
18	60 x 78	32.50	4½	4½	4
18†	60 x 84†	35.00	4½†	4½†	4

† Size of Grate shipped unless otherwise specified.

‡ Y Connection to take one 3-in. and one 3½-in. valve.

* Maximum size of Fire Pot; not shipped as regular.

NO. 60 SMITH BOILER
WITHOUT
SMOKELESS FURNACE
REGULAR TAPPINGS*
SUPPLY DRUM

Outside diameter. 12 in.
Tapped for 2 inch Lock-Nut Nipples. Front end tapped 2 inches.
Rear end tapped one 4 inches, and one 2 inches.

TAPPINGS ON TOP OF SUPPLY DRUM

Number of Sections	Size of Tappings, inches			
	4	5	6	8
8	2	.	2	.
9	2	.	2	.
10	.	2	.	2
11	.	2	.	2
12	.	2	.	2
13	.	2	.	2
14	.	2	.	3
15	.	2	.	3
16	.	2	.	3
17	.	2	.	3
18	.	2	.	3

RETURN DRUMS

Outside diameter. 8 in. 31
Tapped for 2 inch Lock-Nut Nipples
Front ends tapped 2 ½ in.
Rear ends tapped 5 in.
Undersides tapped 1 ¾ in.

FIRE TOOLS FURNISHED

Poker, hoe, flue brush with handle, and ash shovel.

TRIMMINGS FURNISHED WITH STEAM BOILERS

Water column, gauge cocks, water-gauge cocks, water-gauge glass, steam-gauge (with cock), steam-gauge siphon. Damper regulator complete with chain. Pipe and fittings for connecting steam trimmings.

ASBESTOS PLASTER

Plaster is furnished in order that the joints between the sections can be made and the boiler fired before covering the boiler complete. A sufficient amount of plaster is furnished for this purpose only.

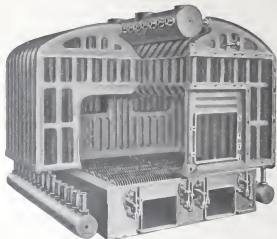
RECOMMENDED CHIMNEY SIZES

Number of Sections in Boiler	For small sizes of coal or for deep beds of fuel, the higher chimneys may be necessary.					
	Diam. inches	Height feet	Diam. inches	Height feet	Diam. Inches	Height feet
8	19	100	20	70	22	40
9	20	100	21	70	24	40
10	21	100	22	75	24	50
11	22	100	23	75	26	50
12	23	100	25	75	27	50
13	24	100	26	75	28	50
14	25	100	27	75	29	50
15	26	100	28	75	30	50
16	27	100	29	75	31	50
17	28	100	29	80	31	60
18	29	100	30	80	32	60

* TAPPINGS other than those listed are SPECIAL. Order must SPECIFY SIZES.

No. 60 Smith Boiler

with
Smokeless Furnace for Bituminous Coal
Patent Applied For



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Interior—No. 60 Smith with Smokeless Furnace

COMMERCIAL RATINGS FOR BITUMINOUS COAL

Number of Sections in Boiler	Size of Fire Pot* inches	Fire (Heating) Surface Sq ft.	Steam	Water
			Rating† feet	Rating† feet
12	60 x 36	515	6600	10900
13	60 x 36	553	7200	11900
13	60 x 42	553	7800	12850
14	60 x 42	591	8400	13850
14	60 x 48	591	9000	14850
15	60 x 48	629	9600	15850
15	60 x 54	629	10200	16850
16	60 x 54	667	10800	17800
17	60 x 60	701	12000	19800
18	60 x 66	739	13200	21800
19	60 x 72	777	14400	23750
20	60 x 78	815	15600	25750

Total Height, 87 in.

Total Width, 98 in.

Height of Water Line, 66 in.

* State which size of fire pot is desired.

† FOR COMPUTING SIZE OF BOILER SEE PAGE 4

NO. 60 SMITH BOILER
WITH
SMOKELESS FURNACE FOR BITUMINOUS COAL
Maximum Allowable Working Pressure—Steam 15 lb., Water 30 lb.
A.S.M.E. Standard
Tested at 60 lb. per sq. in. Hydrostatic Pressure

Number of Sections in Boiler	Size of Fire Pot* inches	Total Length of Boiler inches	Length of Fire Pot* inches	Length at Foundation inches	Size of Smoke Pipe Opening inches
12	60 x 36	110	36	73	
13	60 x 36	116	36	79	
13	60 x 42	116	42	79	16 x 37
14	60 x 42	122	42	85	oval
14	60 x 48	122	48	85	equals
15	60 x 48	128	48	91	in area
15	60 x 54	128	54	91	26 round,
16	60 x 54	134	54	97	in circum-
17	60 x 60	140	60	103	ference
18	60 x 66	146	66	109	29½
19	60 x 72	152	72	115	round
20	60 x 78	158	78	121	

Width at foundation..	72 in.	Dist. betw. center of Grates.....	6 in.
Width of boiler . . .	98 in.	Diameter of supply drum.....	12 in.
Height of boiler . . .	87 in.	Diameter of return drums.....	8 in.
Height of water line...	66 in.	Size of supply drum nipples . . .	2 x 4½ in.
Height of ash pit. . . .	18 in.	Size of return drum nipples . . .	2 x 9 in.
Length of grate bars		Distance from floor to smoke pipe	
(double).....	60 in.	opening	41 in.

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SAFETY VALVE AND WATER RELIEF VALVE SIZES
A.S.M.E Standard

Number of Sections in Boiler	Size of Grate inches	Area of Grate sq. ft.	Working Pressure in lb. per sq. in.		
			0-15 Size of Steam Safety Valve in.	0-25	25-30 Size Water Relief Valves inches
12	60 x 36	15.00	3	3	2½
13†	60 x 36†	15.00	3	3	2½
13	60 x 42	17.50	3	3	3
14†	60 x 42†	17.50	3	3	3
14	60 x 48	20.00	3½	3½	3
15†	60 x 48†	20.00	3½	3½	3
15	60 x 54	22.50	3½	3½	3½
16	60 x 54	22.50	3½	3½	3½
17	60 x 60	25.00	4	4	3½
18	60 x 66	27.50	4	4	3½
19	60 x 72	30.00	4	4	4
20	60 x 78	32.50	4½†	4½†	4

* State which size of Fire Pot is desired.

† Size of grate shipped unless otherwise specified

‡ Y Connection to take one 3-in. and one 3½-in. valve.

NO. 60 SMITH BOILER
WITH
SMOKELESS FURNACE FOR BITUMINOUS COAL
REGULAR TAPPINGS *
SUPPLY DRUM

Outside diameter..... 12 in
Tapped for 2 inch Lock-Nut Nipples. Front end tapped
2 inches. Rear end tapped one 4 inches and one 2 inches.

TAPPINGS ON TOP OF SUPPLY DRUM

Number of Sections	Size of Tappings, in.	
	5	8
Number of Tappings:		
12	2	2
13	2	2
14	2	3
15	2	3
16	2	3
17	2	3
18	2	3
19	2	3
20	2	3

RETURN DRUMS

34 Outside diameter..... 8 in.
Tapped for 2 inch Lock-Nut Nipples
Front ends tapped..... 2½ in.
Rear ends tapped..... 5 in.
Undersides tapped..... 1¼ in.

CHIMNEY SIZES RECOMMENDED

Number of Sections in Boiler	Diam.		Height		Diam.		Height	
	inches	feet	inches	feet	inches	feet	inches	feet
12	20	100	21	75	23	50		
13	20	100	22	75	23	50		
13	21	100	22	75	24	50		
14	21	100	23	75	25	50		
14	22	100	23	75	25	50		
15	22	100	24	75	26	50		
15	23	100	24	80	26	60		
16	23	100	24	80	26	60		
17	24	100	25	80	27	60		
18	25	100	26	80	27	60		
19	25	100	26	90	27	75		
20	26	100	27	90	28	75		

FIRE TOOLS FURNISHED

Rake, hoe, slice bar, flue brush with handle, and ash shovel.

TRIMMINGS FURNISHED WITH STEAM BOILERS

Water column, gauge cocks, water-gauge cocks, water-gauge glass, steam gauge (with cock), steam-gauge siphon. Damper regulator complete with chain. Pipe and fittings for connecting steam trimmings.

ASBESTOS PLASTER

Plaster is furnished in order that the joints between the sections can be made and the boiler fired before covering the boiler complete. A sufficient amount of plaster is furnished for this purpose only.

* TAPPINGS other than those listed are SPECIAL. Order must SPECIFY SIZES.

H-B Boilers



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No. 115 H-B Steam Boiler

No. 215 H-B Boiler is made by adding fire pot extension to the
No. 115 H-B Boiler

H-B BOILERS



36

Rear View

No. 317, 319, 321 and 323 H-B Water Boiler

Showing front and rear connections between Sections

All connections are exposed to view outside of Boiler

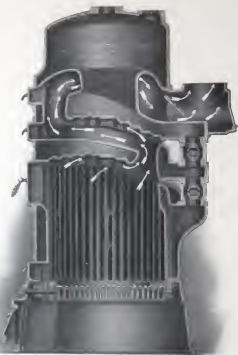
H-B BOILERS



37

Front View

No. 224 and 227 H-B Steam Boiler



38

No. 324 H-B Steam Boiler
 Transverse Section—Arrows indicate Fire Travel
 Showing Horizontal Fire Travel and Large Vertical Water Ways
 COMMERCIAL RATINGS *

Number of Boiler	Nominal Diameter of Fire Pot inches	Steam Rating* feet	Water Rating* feet
115	15	250	425
217	17	325	550
317	17	375	625
219	19	425	700
319	19	475	775
221	21	500	825
321	21	550	900
223	23	600	1000
323†	23	700†	1150†
224	24	650	1075
324	24	800	1325
227	27	900	1500
327	27	1000	1650

† Note No. 323 is larger than No. 224.

* FOR COMPUTING SIZE OF BOILER SEE PAGE 4

H-B BOILERS

Maximum Allowable Working Pressure—Steam 15 lb., Water 30 lb.

Tested at 60 lb. per sq. in. Hydrostatic Pressure A.S.M.E. Standard

DIMENSIONS IN INCHES

Number of Boiler	115	217	317	219	319	221	321
Total Height of Boiler	46	55½	62¼	55¼	62¼	56½	63½
Height of Ash Pit.....	12	12	12	12	12	12	12
Height of Fire Pot.....	....	22½	22½	22½	22½	22½	22½
Height of Intermediate Section.....	....	....	7	....	7	....	7
Height of Dome.....	34	20¾	20¾	20¾	20¾	22	22
Height of Water Line...	39½	49¾	56¾	49¾	56¾	49¾	56¾
Distance from Floor to Smoke Pipe Opening ..	35	42	49	42	49	42	49
Diameter of Smoke Pipe Opening.....	6	7	7	7	7	8	8
Length at Floor.....	25	25	25	27¾	27¾	29¾	29¾
Width at Floor.....	24¾	24¾	24¾	27¼	27¼	29¼	29¼
Outside Diameter of Fire Pot..	19	20½	20½	22½	22½	24½	24½
Outside Diameter of Intermediate Section.....	17	17	21
Outside Diameter of Dome Section.....	19	17	17	17	17	21	21

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DIMENSIONS IN INCHES

Number of Boiler	223	323	224	324	227	327
Total Height of Boiler.....	56½	63½	58	65½	58	65½
Height of Ash Pit.....	12	12	14	14	14	14
Height of Fire Pot.....	22½	22½	22	22	22	22
Height of Intermediate Sec. ....	....	7	....	7½	....	7½
Height of Dome.....	22	22	22	22	22	22
Height of Water Line.....	49¾	56¾	51	58½	51	58½
Distance from Floor to Smoke Pipe Opening.....	42	49	44	51½	44	51½
Diameter of Smoke Pipe Opening.....	8	8	8	8	8	8
Length at Floor.....	32	32	35¼	35¼	38½	38½
Width at Floor.....	31½	31½	33¾	33¾	37	37
Outside Diameter of Fire Pot	26½	26½	28¾	28¾	31¼	31¼
Outside Diameter of Intermediate Section.....	....	21	....	24	....	24
Outside Diameter of Dome Section.....	21	21	24	24	24	24

FIRE TOOLS FURNISHED

Poker and flue brush with handle.

TRIMMINGS FURNISHED WITH STEAM BOILERS

Steam gauge with cock. Water column complete. Two ¼ in. gauge cocks. One pair water-gauge cocks with glass. Damper regulator complete with chain. Pipe and fittings for connecting steam trimmings.

H-B BOILERS
SAFETY VALVE AND WATER RELIEF SIZES
 A.S.M.E. Standard

Number of Boiler	Approx. Diameter of Grate inches	Area of Grate sq. ft.	Working Pressure in lb. per sq. in.		
			0-15	0-25	25-30
			Size Steam Safety Valve, inches	Size Water Relief Valves, inches	
115	13.5	1.12	1	1	1
217	13.5	1.12	1	1	1
317	13.5	1.12	1	1	1
219	16.9	1.35	1	1	1
319	16.9	1.55	1	1	1
221	18.6	1.89	1	1	1
321	18.6	1.89	1	1	1
223	21.0	2.40	1½	1½	1
323	21.0	2.40	1½	1½	1
224	22.6	2.78	1½	1½	1½
324	22.6	2.78	1½	1½	1½
227	25.5	3.53	1½	1½	1½
327	25.5	3.53	1½	1½	1½

REGULAR TAPPINGS *

Number of Boiler	TAPPINGS ON TOP OF DOME						
	Size of Tappings, inches						
	¾	1	1¼	1½	2	2½	3
115	1	2		2		1	
217	1	2		2			1
317	1	2		2			1
219	1	2		2			1
319	1	2		2			1
221	1	1	1	1	1		1
321	1	1	1	1	1		1
223	1	1	1	1	1		1
323	1	1	1	1	1		1
224	1	2		1			2
324	1	2		1			2
227	1	2		1			2
327	1	2		1			2

RETURN TAPPINGS

Nos 115 and 215: One 2½ in. Two 1½ in. Other Boilers: Two 3 in.

RECOMMENDED CHIMNEY SIZES

Number of Boiler	For small sizes of coal or for deep beds of fuel, the higher chimneys may be necessary.					
	Diam. inches	Height feet	Diam. inches	Height feet	Diam. inches	Height feet
115	8	60	8	40	8	25
217	9	75	9	50	9	30
317	9	75	9	50	9	30
219	9	75	9	50	9	35
319	9	75	9	50	10	35
221	9	75	10	50	10	35
321	10	75	10	50	10	35
223	10	75	10	50	11	35
323	10	75	10	50	11	35
224	10	75	10	50	11	35
324	10	75	11	50	11	35
227	10	75	11	50	12	35
327	10	75	11	50	12	35

* TAPPINGS other than those listed are SPECIAL. Order must SPECIFY SIZES.

Menlo Boilers



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Nos. 10, 12 and 14 Water Boilers
Interior Showing Fire Travel

No. 214 Menlo Boiler is made by adding fire pot extension

COMMERCIAL RATINGS*

Number of Boiler	Diameter of Fire Pot inches	Steam	Water	Hot Water Supply
		Rating* feet	Rating* feet	Rating gallonst
10	10	...	200	225
12	12	...	300	350
14	14	...	400	500
214	14	...	500	750
16	16	..	500	...
18	18	..	600	...
20	20	..	800	...

† Tank capacity for various sizes of Boiler for Hot Water Supply—average condition.

NOTE. — Not capacity in gallons per hour to be raised from a low to a high temperature.

* FOR COMPUTING SIZE OF BOILER SEE PAGE 4

MENLO BOILERS
DIMENSIONS IN INCHES

Number of Boiler	10	12	14	214	16	18	20
Total Height of Boiler	32	33½	39	45½	50	50	51
Height of Ash Pit . . .	8	8	12	12	12	12	12
Height of Water Line					44	44	45
Height of Dome	24	25½	27	27	38	38	39
Outside Diameter of Dome	15	17½	20	20	22	24	26
Distance from Floor to Center of Smoke Pipe Opening	25	26	31¼	37½	37½	37½	38
Diameter of Smoke Pipe Opening	5	5	6	6	7	7	8
Length at Floor	19½	22	25	25	27¾	29¾	32
Width at Floor	19½	22	24¾	24¾	27½	29½	31½

MAXIMUM ALLOWABLE WORKING PRESSURE
A S M. E. Standard

Number of Boiler	Tested Hydrostatic Pressure lb. per sq. in.	Maximum Allowable Working Pressure lb. per sq. in.	
		Water	Steam
10	200	80	..
12	175	70	..
14	150	60	..
214	150	60	..
16	75	30	..
18	75	30	..
20	75	30	..

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FIRE TOOLS FURNISHED, Nos. 16, 18 and 20—Poker.

TRIMMINGS FURNISHED WITH STEAM BOILERS

Steam gauge with cock. One pair water-gauge cocks with glass.
Water column complete. Damper regulator complete with chain.
Two ½ in. gauge cocks. Pipe and fittings for connecting steam trimmings.

SAFETY VALVE AND WATER RELIEF VALVE SIZES
A S M. E. Standard

Number of Boiler	Approx. Diameter of Grate inches	Area of Grate sq. ft.	Working Pressure in lb. per sq. in.		
			0-15 Size Steam Safety Valve, inches	0-25 Size Water Relief Valves inches	25-80
10	10.00	.55	..	1	1
12	12.00	.79	..	1	1*
14	13.50	1.12	..	1	1†
214	13.50	1.12	..	1	1†
16	16.90	1.55	1	1	1‡
18	18.60	1.89	1	1	1‡
20	21.00	2.40	1¼	1¼	1‡

* Maximum allowable working pressure, water, 70 lb. per sq. in.

† Maximum allowable working pressure, water, 60 lb. per sq. in.

‡ Maximum allowable working pressure, water, 30 lb. per sq. in.

MENLO BOILER



43

Nos. 16, 18 and 20 Water Boilers

REGULAR TAPPINGS

No.	Supply	Return
10	One 2 in.	Three 2 in.
12	One 2 in.	Three 2 in.
14	One 2½ in.	Three 2 in.
214	One 2½ in.	One 2½ in., four 1½ in.
16	One 3 in., two 1½ in., two 1 in.	One 3 in., two 2 in.
18	One 3 in., two 1½ in., two 1 in.	One 3 in., two 2 in.
20	One 3 in., two 1½ in., two 1 in.	One 3 in., two 2 in.

RECOMMENDED CHIMNEY SIZES

Number of Boiler	For small sizes of coal or for deep beds of fuel, the higher chimneys may be necessary.					
	Diam. inches	Height feet	Diam. inches	Height feet	Diam. inches	Height feet
10	8	60	8	40	8	25
12	8	60	8	40	8	25
14	8	60	8	40	8	25
214	8	75	8	50	8	40
16	8	75	8	50	8	30
18	9	75	9	50	9	30
20	9	75	9	50	10	35

Smith Service Boilers W-17

FOR HOT WATER SUPPLY



44

Front View
Shipped Knocked Down
COMMERCIAL RATINGS

Number of Sections	Nominal Size of Fire Pot, inches	Fire (Heating) Surface, sq. ft.	Rating gallons †
4	18 x 12	24.0	900
5	18 x 16	29.5	1200
6	18 x 20	35.0	1500
7	18 x 24	40.5	1800
8	18 x 28	46.0	2100
9	18 x 32	51.5	2400
10	18 x 36	57.0	2700
11	18 x 40	62.5	3000

† Tank capacity for various sizes of Boiler for Hot Water Supply—Average Condition.

NOTE—Not capacity in gallons per hour to be raised from a low to a high temperature.

Smith Service Boilers W-17

SMITH SERVICE BOILERS W-17

Maximum Allowable Working Pressure, 160 lb.
A.S.M.E. Standard
Tested at 400 lb. per sq. in. Hydrostatic Pressure



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Interior DIMENSIONS

Number of Sections	Nominal Size of Fire Pot inches	Total Length of Boiler inches	Length of Fire Pot inches	Length at Foundation inches	Diameter of Smoke Pipe Opening inches
4	18 x 12	30½	12	18½	8
5	18 x 16	34½	16	22½	8
6	18 x 20	38½	20	26½	8
7	18 x 24	42½	24	30½	8
8	18 x 28	46½	28	34½	8
9	18 x 32	50½	32	38½	8
10	18 x 36	54½	36	42½	8
11	18 x 40	58½	40	46½	8

Width at foundation 23 in. Length of grate bar 14 in.
Width of boiler 24½ in. Dist. betw center of grates . . . 4 in.
Height of boiler 50½ in. Distance from floor to center of
Height of ash pit 12 in. smoke pipe opening 40½ in.

FIRE TOOLS FURNISHED

Poker, hoe, flue brush with handle, ash shovel.

Four brass washout plugs are furnished with boiler.

Water relief valve, altitude gauge and thermometer are NOT furnished.

SMITH SERVICE BOILERS W-17 are shipped knocked down.

SMITH SERVICE BOILER W-17
FOR HOT WATER SUPPLY
REGULAR TAPPINGS

Tappings	No	Size	Location
Supply.....	1	3 in.	Top
Water relief valve (see table of W. R. Valve sizes below).....	1	3 in.	Top
Return.....	1	3 in.	Rear
Draw off.....	2	$\frac{3}{4}$ in.	Sides of Front Section
Altitude gauge.....	1	$\frac{3}{4}$ in.	Top of Front Section
Thermometer.....	1	$\frac{3}{4}$ in.	Top of Front Section
Washout holes (at bottom)....	4	$2\frac{1}{2}$ in.	Two in front, two in rear

ASBESTOS PLASTER

Plaster is furnished in order that the joints between the sections can be made and the boiler fired before covering the boiler complete. A sufficient amount of plaster is furnished for this purpose only.

WATER RELIEF VALVE SIZES

46	Working Pressure lb. per sq. in.		0-25 25-50 50-100 100-150 150-200					
	Number of Sections	Size of Grate inches	Area of Grate sq. ft.	Size of Water Relief Valve A.S.M.E. Standard				
	4	14 x 12	1.17					
	5	14 x 16	1.56	1 in.	1 in.			
	6	14 x 20	1.94			1 in.		
	7	14 x 24	2.33				1 in.	1 in.
	8	14 x 28	2.72	$1\frac{1}{4}$ in.				
	9	14 x 32	3.11					
	10	14 x 36	3.50		$1\frac{1}{4}$ in.	$1\frac{1}{4}$ in.		
	11	14 x 40	3.89	$1\frac{1}{2}$ in.			$1\frac{1}{4}$ in.	$1\frac{1}{4}$ in.

CHIMNEY SIZES RECOMMENDED

Number of Sections in Boiler	For small sizes of coal or for deep beds of fuel, the higher chimneys are required.					
	Diam. inches	Height feet	Diam. inches	Height feet	Diam. inches	Height feet
4	8	75	9	50	9	25
5	9	75	9	50	10	25
6	9	75	10	50	11	25
7	10	75	10	50	11	25
8	10	75	11	50	12	25
9	11	75	11	50	13	25
10	11	75	12	50	13	25
11	11	75	12	50	14	25

No. 18 Mercer Return Flue Boiler



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No. 18 Steam Boiler

COMMERCIAL RATINGS

Number of Sections	Size of Fire Pot inches	Fire (Heating) Surface sq. ft.	Steam	Water
			Rating* feet	Rating* feet
4	18 x 18	37.	475	775
5	18 x 24	46.5	625	1025
6	18 x 30	56.	775	1275
7	18 x 36	65.5	925	1525
8	18 x 42	75.	1075	1775
9	18 x 48	84.5	1225	2025
10	18 x 48	97.	1375	2275
10	18 x 54†	94.	1375	2275
11	18 x 54	106.5	1525	2525
11	18 x 60†	103.5	1525	2525
12	18 x 54	116.	1675	2775
12	18 x 66†	113.	1675	2775

Total Height, 68½ in.

Total Width, 47 in.

Height of Water Line, 50½ in.

† Maximum size of Fire Pot, not shipped as regular.

* FOR COMPUTING SIZE OF BOILER SEE PAGE 4

No. 18 Mercer Boilers

NO. 18 MERCER RETURN FLUE BOILER

Maximum Allowable Working Pressure—Steam 15 lb., Water 30 lb.

A.S.M.E. Standard

Tested at 60 lb. per sq. in. Hydrostatic Pressure

DIMENSIONS

Number of Sections	Nominal Size of Fire Pot	Total Length of Boiler	Length of Fire Pot	Length at Foundation	Diameter of Smoke Pipe Opening
	inches	inches	inches	inches	inches
4	18 x 18	34	18	26	9
5	18 x 24	40	24	32	9
6	18 x 30	46	30	38	9
7	18 x 36	52	36	44	9
8	18 x 42	58	42	50	9
9	18 x 48	64	48	56	9
10	18 x 48	70	48	62	9
10	18 x 54*	70	54*	62	9
11	18 x 54	76	54	68	9
11	18 x 60*	76	60*	68	9
12	18 x 54	82	54	74	9
12	18 x 66*	82	66*	74	9

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Width at foundation	27 in.	Dist. betw. center of grates	6 in.
Width of boiler	47 in.	Outside diameter of supply drum	6 in.
Height of boiler	68½ in.	Outside diameter of return drums	4½ in.
Height of water line	50½ in.	Size of supply drum nipples	1½ x 6 in.
Height of ash pit	12 in.	Size of return drum nipples	1½ x 6 in.
Length of grate bar	18 in.	Distance from floor to center of smoke pipe opening	47½ in.

SAFETY VALVE AND WATER RELIEF VALVE SIZES

A S M.E. Standard

Number of Sections in Boiler	Size of Grate	Area of Grate	Working Pressure in lb. per sq. in.		
			0-15	0-25	25-30
			Size Steam Safety Valve, inches	Size Water Relief Valves, inches	
	inches	sq. ft.			
4	18 x 18	2.25	1¼	1¼	1¼
5	18 x 24	3.00	1¼	1¼	1¼
6	18 x 30	3.75	1½	1½	1½
7	18 x 36	4.50	1½	1½	1½
8	18 x 42	5.25	2	2	1½
9	18 x 48	6.00	2	2	2
10†	18 x 48†	6.00	2	2	2
10	18 x 54	6.75	2	2	2
11†	18 x 54†	6.75	2	2	2
11	18 x 60	7.50	2	2	2
12†	18 x 54†	6.75	2	2	2
12	18 x 60	7.50	2	2	2
12	18 x 66	8.25	2½	2½	2

* Maximum size of Fire Pot, not shipped as regular.

† Size of grate shipped unless otherwise specified.

NO. 18 MERCER RETURN FLUE BOILER

REGULAR TAPPINGS *

TAPPINGS ON TOP
OF SUPPLY DRUM

Number of Sections	Size of Tappings, in.							
	Ste'm	Wat'r	1¼	1½	2	2½	3	4
		4	1	.	2	.	1	.
4		5	1	.	2	.	1	.
5		6	.	1	2	.	1	.
6		7	.	1	2	.	1	.
7		8	.	.	2	.	1	1
8		9	.	.	1	1	1	1
9		10	.	.	1	1	1	1
10		11	.	.	1	1	1	1
11		12	.	.	.	2	1	1
12			.	.	.	2	1	1

STEAM DRUM

Outside diameter.....6 in.
Tapped for 1½ in. Lock-Nut Nipples
Ends tapped.....2½ in.

RETURN DRUMS

Outside diameter.....4½ in.
Tapped for 1½ in. Lock-Nut Nipples
Top and bottom at opposite ends tapped.....2 in.
Side tapped.....1¼ in.
Front ends tapped.....2½ in.
Rear ends tapped
4-10 sections.....2½ in.
11 and 12 sections.....3 in.

FIRE TOOLS FURNISHED

Flue brush (with handle), hoe, poker, and ash shovel.

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TRIMMINGS FURNISHED WITH STEAM BOILERS

Water column, gauge cock, water-gauge cock, water-gauge glass, steam gauge (with cock), steam-gauge siphon. Damper regulator complete with chain.

ASBESTOS PLASTER

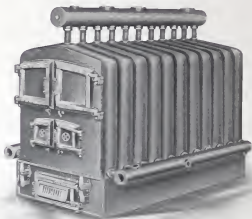
Plaster is furnished in order that the joints between the sections can be made and the boiler fired before covering the boiler complete. A sufficient amount of plaster is furnished for this purpose only.

RECOMMENDED CHIMNEY SIZES

Number of Sections in Boiler	For small sizes of coal or for deep beds of fuel, the taller chimneys may be necessary.					
	Diam. inches	Height feet	Diam. inches	Height feet	Diam. inches	Height feet
4	9	75	9	50	10	35
5	9	75	10	50	11	35
6	10	75	11	50	11	35
7	11	75	11	50	12	35
8	11	75	12	50	13	35
9	12	75	12	60	13	40
10	12	75	13	60	14	40
11	13	75	13	60	14	40
12	13	75	14	60	15	40

* Tappings other than those listed are special, order must specify sizes.

No. 27 Mercer Return Flue Boiler



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No. 27 Water Boiler

COMMERCIAL RATINGS

Number of Sections	Size of Fire Pot inches	Fire (Heating) Surface sq. ft.	Steam	Water
			Rating* feet	Rating* feet
6	27 x 30	71.5	1400	2300
7	27 x 36	82.5	1700	2800
8	27 x 42	94	2000	3300
9	27 x 48	105.5	2300	3800
10	27 x 54	117.	2600	4300
11	27 x 54	134.	2900	4775
11	27 x 60†	128.5	2900	4775
12	28 x 54	145.	3200	5275
12	27 x 66†	139.5	3200	5275
13	27 x 60	156.5	3500	5775
13	27 x 72†	151.	3500	5775
14	27 x 60	168.	3800	6275
14	27 x 78†	162.5	3800	6275

Total Height.....80 in. Total Width, Steam Boiler.56 in.
 Height of Water Line.....57 in. Total Width, Water Boiler.59 in.

† Maximum size of Fire Pot, not shipped as regular.

* FOR COMPUTING SIZE OF BOILER SEE PAGE 4

NO. 27 MERCER RETURN FLUE BOILER

Maximum Allowable Working Pressure—Steam 15 lb., Water 30 lb.

A.S.M.E. Standard

Tested at 60 lb. per sq. in. Hydrostatic Pressure

DIMENSIONS

Number of Sections	Nominal Size of Fire Pot	Total Length of Boiler	Length of Fire Pot	Length at Foundation	Diameter of Smoke Pipe Opening
	inches	inches	inches	inches	inches
6	27 x 30	46	30	38	12
7	27 x 36	52	36	44	12
8	27 x 42	58	42	50	12
9	27 x 48	64	48	56	12
10	27 x 54	70	54	62	12
11	27 x 54	76	54	68	12
11	27 x 60*	76	60*	68	12
12	27 x 54	82	54	74	12
12	27 x 66*	82	66*	74	12
13	27 x 60	88	60	80	12
13	27 x 72*	88	72*	80	12
14	27 x 60	94	60	86	12
14	27 x 78*	94	78*	86	12

Width at foundation . . . 35 in. Dist. betw. center of grates . . . 6 in.
 Width of boiler 51 in. Outside dia. supply drum . . 8 in.
 Width of boiler, steam . . 56 in. Outside dia. return drums, steam $4\frac{1}{2}$ in.
 Width of boiler, water . . 59 in. Outside dia. return drums, water, 6 in.
 Height of boiler 80 in. Size of supply drum nipples 2 x 6 in.
 Height of water line . . . 57 in. Size of return drum nipples $1\frac{1}{2}$ x 6 in.
 Height of ash pit 16 in. Distance from floor to smoke
 Length of Grate Bar . . . 27 in. pipe opening 55 in.

SAFETY VALVE AND WATER RELIEF VALVE SIZES

A.S.M.E. Standard

Number of Sections in Boiler	Size of Grate	Area of Grate	Working Pressure in lb. per sq. in.		
			0-15	0-25	25-30
			Size Steam Safety Valve, inches	Size Water Relief Valves	
inches	sq. ft.		inches		
6	27 x 30	5.63	2	2	2
7	27 x 36	6.75	2	2	2
8	27 x 42	7.88	2	2	2
9	27 x 48	9.00	$2\frac{1}{2}$	$2\frac{1}{2}$	2
10	27 x 54	10.13	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$
11†	27 x 54†	10.13	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$
11	27 x 60	11.25	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$
12†	27 x 54†	10.13	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$
12	27 x 60	11.25	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$
12	27 x 66	12.38	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$
13†	27 x 60†	11.25	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$
13	27 x 66	12.38	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$
13	27 x 72	13.50	3	3	$2\frac{1}{2}$
14†	27 x 60†	11.25	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$
14	27 x 66	12.38	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$
14	27 x 72	13.50	3	3	$2\frac{1}{2}$
14	27 x 78	14.63	3	3	$2\frac{1}{2}$

NOTE—* Maximum size of Fire Pot; not shipped as regular.

† Size of grate shipped unless otherwise specified.

NO. 27 MERCER RETURN FLUE BOILER
REGULAR TAPPINGS*

SUPPLY DRUM

Outside diameter.....8 in.
Tapped for 2 in. Lock-Nut
Nipples
Each end tapped..... 2½ in.

TAPPINGS ON TOP
OF SUPPLY DRUM

Number of Sections		Size of Tappings, in				
		2	2½	3	4	5
Ste'm	Wat'r	Number of Tappings				
			6	1	2	1
6	7	1	2	1		
7	8	1	2	1		
8	9	1	1	1	1	
9	10	1	1	1	1	
10	11	1	1	1	1	
11	12	1	1	1	1	
12	13		1	2	1	
13	14		1	2	1	
14			1	2	1	

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RETURN DRUMS

STEAM BOILERS:

Outside diameter.....4½ in.
Tapped for 1½ in. Lock-Nut
Nipples
Side tapped.....2 in.
Underside tapped.....1½ in.
6-10 sections:
Each end tapped.....2½ in.
11-14 sections:
Front ends tapped.....2½ in.
Rear ends tapped.....3 in.

WATER BOILERS:

Outside diameter.....6 in.
Tapped for 1½ in.
Lock-Nut Nipples
Underside tapped.....1½ in.
6-8 sections:
Front ends tapped.....2½ in.
Rear ends tapped.....4 in.
Side tapped.....2 in.
9-12 sections:
Front ends tapped.....2½ in.
Rear ends tapped.....5 in.
Side tapped.....2 in.
13 and 14 sections:
Front ends tapped, one 2½,
one 5 in.
Rear ends tapped, one 2½,
one 5 in.
Side tapped, one 4, one 2 in.

FIRE TOOLS FURNISHED

Flue brush (with handle), boe, poker, and ash shovel.

TRIMMINGS FURNISHED WITH STEAM BOILERS

Water column, gauge cock, water-gauge cock, water-gauge glass, steam gauge (with cock), steam-gauge siphon. Damper regulator complete with chain.

ASBESTOS PLASTER

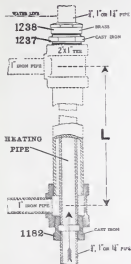
Plaster is furnished in order that the joints between the sections can be made and the boiler fired before covering the boiler complete. A sufficient amount of plaster is furnished for this purpose only.

RECOMMENDED CHIMNEY SIZES

Number of Sections in Boiler	For small sizes of coal or for deep beds of fuel, the taller chimneys may be necessary.					
	Diam. inches	Height feet	Diam. inches	Height feet	Diam. inches	Height feet
6	12	75	13	50	14	35
7	13	75	14	50	15	35
8	14	75	15	50	16	35
9	15	75	16	50	17	40
10	15	80	16	60	17	40
11	16	80	17	60	18	40
12	16	100	17	75	18	50
13	16	100	17	75	18	50
14	17	100	18	75	19	50

* Tappings other than those listed are special, order must specify sizes.

Heating Capacities of Hot Water Supply Fittings with Brass and Iron Pipe



At the left is shown an arrangement of pipe and fittings used in connection with a steam or water boiler and as a substitute for a water back for furnishing a supply of hot water.

The upper horizontal 1-inch iron pipe is connected to the heating boiler not less than 4 inches below the water line in the case of a steam boiler or in a corresponding position on a water boiler. The lower one may be connected to a return main or directly to the lower part of the boiler. The hot water supply pipe enters at the bottom and leaves thru the stuffing box at the top. The pipes and fittings should be covered with heat insulating material.

The heating capacity of this arrangement depends upon several factors:

- (1) The initial and the final temperatures of the water to be heated.
- (2) The length (L) and the diameter of the heating pipe.
- (3) The material of the heating pipe, whether brass or iron.

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- (4) The condition of the heating pipe and the freedom of circulation thru and around it.

The heat given to the supply water reduces the house heating capacity of the boiler or increases the load on it by an equivalent amount and this should be taken into account when selecting the boiler.

The following tables can be used in calculating the gallons of water per hour which it is possible to heat from one temperature to another and the number of feet of steam radiation to which it is equivalent.

The tables have been calculated on the following bases:

- (1) On one foot length of $\frac{3}{4}$ inch brass heating pipe
 - (a) for any other length multiply by the length in feet
 - (b) for one foot of 1 inch brass pipe multiply by 1.25
for one foot of $1\frac{1}{4}$ inch brass pipe multiply by 1.5
 - (c) for iron pipe multiply by 0.65 the results for corresponding length and size of brass pipe.
- (2) The capacities given are for clean pipe with free circulation.
 - (a) In practice, to allow for fouling of pipe and retarded circulation, the capacities should be reduced to $\frac{3}{5}$ or $\frac{1}{2}$ of those given by the use of the tables.

The following examples illustrate the application of tables.

(1) Data given: Temperature of water in steam heating boiler, 200° . Distance between boiler connections, 3 feet. Size and material of heating pipe, 1 inch iron. Initial temperature of water to be heated, 60° . Final temperature of water to be heated, 140° .

Wanted: Gallons of water which can be heated per hour and the feet of steam radiation added to the load on the boiler.

From the 200° table under the 140° final temperature column and on the 60° initial temperature line, the gal. per hr. are given as 18.2 and the steam radiation as 50.

The length of heating pipe is 3 feet. Correction for length, $18.2 \times 3 = 54.6$. Correction for size, $54.6 \times 1.25 = 68.2$. Correction for iron pipe $68.2 \times 0.65 = 44.3$. Allowance for fouling, etc. $44 \times \frac{1}{2} = 22$ gal. per hr. Similarly for the radiation = 61 feet of steam radiation.

Hot Water Supply Fittings

(2) An hourly supply of 24 gallons of hot water at a temperature of 160° is wanted. The initial temperature of the water is 80°. If the water in the hot water heating boiler is at 180° and the length of the heating pipe can be four feet what size brass pipe should be used?

If it is assumed that $\frac{3}{4}$ of the clean pipe capacity will be secured, then provision should be made for $24 \div \frac{3}{4} = 36$ gal. per hour.

For each foot of length, $36 \div 4 = 9.0$ gal. per hour.

From the 180° table it is shown that one foot of $\frac{3}{4}$ inch brass pipe will heat 6 gal. per hr. from 80° to 160°.

For 1-inch brass, $6 \times 1.25 = 7.5$ gal. per hr. (not enough)

For $1\frac{1}{4}$ -inch brass $6 \times 1.5 = 9.0$ gal. per hr. (just sufficient)

Therefore it would be necessary to use the $1\frac{1}{4}$ inch pipe and fittings.

The added load on the boiler may be found as in the previous example and then multiplying by 1.65 to give the feet of water radiation.

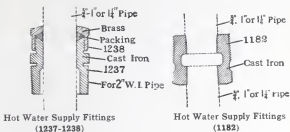
CAPACITY OF HOT WATER SUPPLY FITTINGS WITH ONE FOOT OF CLEAN $\frac{3}{4}$ -INCH BRASS PIPE

Temp. of Water in Boiler	Initial Temp. of Supply Water	Final Temp. of Supply Water							For Water Radiation Multiply Steam Radiation by 1.65
		200°	180°	160°	140°	120°	100°	80°	
220 deg. corresponding to 2½ lb. steam pressure	40°	5.6	10.	15.4	25.	34.	52.	87.	gal. per hr. steam radia.
		32.	48.	64.	80.	93.	108	119	gal. per hr. steam radia.
	60°	5.7	10.5	16.2	26.	40.	71.	159	gal. per hr. steam radia.
		27.	43.	56.	70.	83.	98	109	gal. per hr. steam radia.
	80°	5.7	10.7	18.2	30.	53.	124	...	gal. per hr. steam radia.
	24.	37.	50.	61.	73.	85.	...	gal. per hr. steam radia.	
	100°	5.8	11.6	20.6	39.	91.	...	gal. per hr. steam radia.	
		20.	32.	43.	53.	62.	...	gal. per hr. steam radia.	
	120°	6.0	12.7	25.6	66.	...	...	gal. per hr. steam radia.	
		16	26	35	45.	...	...	gal. per hr. steam radia.	
200 deg. corresponding to 7-inch vacuum	40°	...	5.7	10.5	16.2	25.7	40.3	71	gal. per hr. steam radia.
		...	27.	43.	56.	70.	83.	98	gal. per hr. steam radia.
	60°	...	5.7	10.7	18.2	29.8	53.	124	gal. per hr. steam radia.
		...	24.	37.	50.	61.	73.	85.	gal. per hr. steam radia.
	80°	...	5.8	11.6	20.6	38.9	91.	...	gal. per hr. steam radia.
	...	20.	32.	43.	53.	62.	...	gal. per hr. steam radia.	
	100°	...	6.0	12.7	25.6	66.2	...	gal. per hr. steam radia.	
	...	...	16.	26.	35.	45.	...	gal. per hr. steam radia.	
	120°	...	6.2	15.3	42.4	...	...	gal. per hr. steam radia.	
	...	...	13	21	29.	...	...	gal. per hr. steam radia.	
180 deg.	40°	...	...	5.7	10.7	18.2	29.8	53.	gal. per hr. steam radia.
		...	...	24.	37.	50.	61.	73.	gal. per hr. steam radia.
	60°	...	...	5.8	11.6	20.6	39.8	91.	gal. per hr. steam radia.
		...	...	20	32.	43.	53.	62.	gal. per hr. steam radia.
	80°	...	...	6.0	12.7	25.6	66.2	...	gal. per hr. steam radia.
	...	...	16.	26.	35.	45.	...	gal. per hr. steam radia.	
	100°	...	...	6.2	15.3	42.4	...	gal. per hr. steam radia.	
	...	...	...	13.	21.	29.	...	gal. per hr. steam radia.	
	120°	...	...	6.8	23.2	...	...	gal. per hr. steam radia.	
	...	...	...	9.3	16.	...	...	gal. per hr. steam radia.	
160 deg.	40°	...	...	...	5.8	11.6	20.6	39.8	gal. per hr. steam radia.
		...	...	...	20.	32.	43.	53.	gal. per hr. steam radia.
	60°	...	...	...	6.0	12.7	25.6	66.2	gal. per hr. steam radia.
		...	...	...	16.	26.	35.	45.	gal. per hr. steam radia.
	80°	...	...	...	6.2	15.3	42.4	...	gal. per hr. steam radia.
	...	...	...	13.	21.	29.	...	gal. per hr. steam radia.	
	100°	...	...	...	6.8	23.2	...	gal. per hr. steam radia.	
	...	...	...	...	9.3	16.	...	gal. per hr. steam radia.	
	120°	...	...	...	9.6	...	...	gal. per hr. steam radia.	
	...	...	...	...	6.6	...	...	gal. per hr. steam radia.	
140 deg.	40°	...	...	...	...	6.0	12.7	25.6	gal. per hr. steam radia.
		...	...	...	...	16.	26.	35.	gal. per hr. steam radia.
	60°	...	...	...	...	6.2	15.3	42.4	gal. per hr. steam radia.
		...	...	...	...	13.	21.	29.	gal. per hr. steam radia.
	80°	...	...	...	...	6.8	23.2	...	gal. per hr. steam radia.
	...	...	...	...	9.3	16.	...	gal. per hr. steam radia.	
	100°	...	...	...	...	9.6	...	gal. per hr. steam radia.	
	...	...	...	...	...	6.6	...	gal. per hr. steam radia.	

FITTINGS SHIPPED FOR 2" W. I. PIPE

1 fitting 1237 with brass stuffing box 1238 ($\frac{3}{4}$ ", 1", 1 $\frac{1}{4}$ " iron pipe sizes.

1 fitting 1182 ($\frac{3}{4}$ ", 1", 1 $\frac{1}{4}$ " iron pipe sizes.



BOILER	L Inches
No. 24 Mills...	27 $\frac{1}{2}$
No. 34 " " "	40
No. 44 " " "	45
No. 48 " " "	72
No. 36 Smith	35
No. 60 " " "	53
No. 18 Mercer	31
No. 27 " " "	33
No. 36 " " "	35
Nos. 16-18 Menlo..	25
No. 20 " " "	26
No. 15 H-B..	21
No. 215 " " "	27
Nos. 217-219 " " "	31
Nos. 317-319 " " "	38
Nos. 221-223 " " "	30 $\frac{1}{2}$
Nos. 321-323 " " "	37 $\frac{1}{2}$
Nos. 224-227 " " "	30
Nos. 324-327 " " "	37 $\frac{1}{2}$

L—Approximate Length of Heating Pipe
See illustration on page 53

Direct Radiators

56

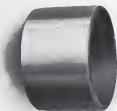


Two-Column Princess—Steam



Two-Column Princess—Water

DIRECT RADIATORS



Push Nipple

MALLEABLE IRON PUSH NIPPLE CONNECTION FOR
DIRECT RADIATORS

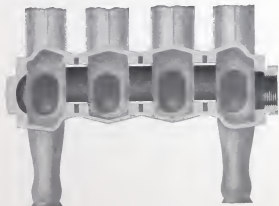
RADIATOR SECTIONS are bored or milled to gauge with a taper of $\frac{3}{4}$ of an inch to the foot.

The standard taper of wrought iron pipe threads is $\frac{3}{4}$ of an inch to the foot.

57

PUSH NIPPLES: The surface is crowning, lathe turned under a copious stream of lubricant, which gives a smooth "water polish."

The above, in brief, is a description of the method of producing our malleable iron push nipple connection, so long acknowledged by the trade to be **PERFECT** and **INDESTRUCTIBLE** under working conditions.



Sectional View



58

Princess—Single Column



Princess—Three Column

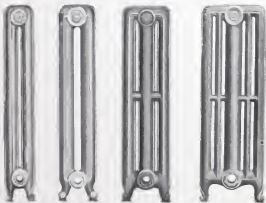
DIRECT RADIATORS



59

Princess—Five-Column

END VIEWS



Single-Column

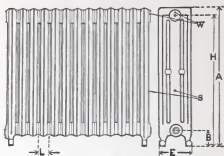
Two-Column

Three-Column

Five-Column

Direct Radiators

PRINCESS DIRECT RADIATORS



DIMENSIONS IN INCHES

60

Radiator Columns	Princess			Five Column	
	Single Column	Two Column	Three Column	Heights	
				37 and 25	16, 14, 12
E Width of section . . .	5¼	7	9	12	12
L Length of section . . .	3	3	3¼	3¼	3¼
B Height to center of regular tapping	4½	4½	4½	4½	3

SINGLE COLUMN

A Total Height	45	37	31	25	22	19
H Height of Top Tapping, Princess	43¼	34½	28½	23	20	17

TWO COLUMN

A Total Height	45	37	31	25	22	19
H Height of Top Tapping, Princess	43	35	29	23	20	17

THREE COLUMN

A Total Height	45	37	31	25	22	19
H Height of Top Tapping, Princess	43	35	29½	23½	20	17½

FIVE COLUMN

A Total Height	Princess		Window Heights		
	37	25	16	14	12
H Height of Top Tapping, Princess	35	23	14	12	10

S = Location of air vent tapping, steam.
 W = Location of air vent tapping, water.

PRINCESS DIRECT RADIATORS
STEAM OR WATER

Single-Column

Radiating Surface in Feet

Sec- tions	Total Length		HEIGHT, INCHES					
			45	37	31	25	22	19
			4½ ft. per sec.	3½ ft. per sec.	3 ft. per sec.	2½ ft. per sec.	2¼ ft. per sec.	2 ft. per sec.
	ft. - in.							
3	0 - 10	13½	10½	9	7½	6¾	6	
4	1 - 1	18	14	12	10	9	8	
5	1 - 4	22½	17½	15	12½	11¼	10	
6	1 - 7	27	21	18	15	13½	12	
7	1 - 10	31½	24½	21	17½	15¾	14	
8	2 - 1	36	28	24	20	18	16	
9	2 - 4	40½	31½	27	22½	20¼	18	
10	2 - 7	45	35	30	25	22½	20	
11	2 - 10	49½	38½	33	27½	24¾	22	
12	3 - 1	54	42	36	30	27	24	
13	3 - 4	58½	45½	39	32½	29¼	26	
14	3 - 7	63	49	42	35	31½	28	
15	3 - 10	67½	52½	45	37½	33¾	30	
16	4 - 1	72	56	48	40	36	32	
17	4 - 4	76½	59½	51	42½	38¼	34	
18	4 - 7	81	63	54	45	40½	36	
19	4 - 10	85½	66½	57	47½	42¾	38	
20	5 - 1	90	70	60	50	45	40	
21	5 - 4	94½	73½	63	52½	47¼	42	
22	5 - 7	99	77	66	55	49½	44	
23	5 - 10	103½	80½	69	57½	51¾	46	
24	6 - 1	108	84	72	60	54	48	
25	6 - 4	112½	87½	75	62½	56¼	50	
26	6 - 7	117	91	78	65	58½	52	
27	6 - 10	121½	94½	81	67½	60¾	54	
28	7 - 1	126	98	84	70	63	56	
29	7 - 4	130½	101½	87	72½	65¼	58	
30	7 - 7	135	105	90	75	67½	60	

61

DIMENSIONS

See page 60

Width of Section	5¼ in.
Length of Section	3 in.
Height to Center of Regular Tapping	4½ in.

REGULAR TAPPING, SEE PAGE 80

Direct Radiators

PRINCESS DIRECT RADIATORS
STEAM OR WATER

Two-Column

Radiating Surface in Feet

Sec- tions	Total Length ft. - in.	HEIGHT, INCHES					
		45	37	31	25	22	19
		5 ft. per sec.	4 ft. per sec.	3½ ft. per sec.	3 ft. per sec.	2¾ ft. per sec.	2¼ ft. per sec.
3	0 - 10	15	12	10½	9	7¾	6¾
4	1 - 1	20	16	14	12	10½	9
5	1 - 4	25	20	17½	15	13¾	11¼
6	1 - 7	30	24	21	18	15¾	13½
7	1 - 10	35	28	24½	21	18¾	15¾
8	2 - 1	40	32	28	24	21	18
9	2 - 4	45	36	31½	27	23¾	20¼
10	2 - 7	50	40	35	30	26¼	22½
11	2 - 10	55	44	38½	33	28¾	24¾
12	3 - 1	60	48	42	36	31½	27
13	3 - 4	65	52	45½	39	34¾	29¼
14	3 - 7	70	56	49	42	36¾	31½
15	3 - 10	75	60	52½	45	39¾	33¾
16	4 - 1	80	64	56	48	42	36
17	4 - 4	85	68	59½	51	44¾	38¼
18	4 - 7	90	72	63	54	47¼	40½
19	4 - 10	95	76	66½	57	49¾	42¾
20	5 - 1	100	80	70	60	52½	45
21	5 - 4	105	84	73½	63	55¾	47¼
22	5 - 7	110	88	77	66	57¾	49½
23	5 - 10	115	92	80½	69	60¾	51¾
24	6 - 1	120	96	84	72	63	54
25	6 - 4	125	100	87½	75	65¾	56¼
26	6 - 7	130	104	91	78	68¼	58½
27	6 - 10	135	108	94½	81	70¾	60¾
28	7 - 1	140	112	98	84	73½	63
29	7 - 4	145	116	101½	87	76¼	65¼
30	7 - 7	150	120	105	90	78¾	67½

62

DIMENSIONS

See page 60

Width of Section	7 in.
Length of Section.....	3 in.
Height to Center of Regular Tapping	4¾ in.

REGULAR TAPPING, SEE PAGE 80

PRINCESS DIRECT RADIATORS
STEAM OR WATER

Three-Column

Radiating Surface in Feet

Sec- tions	Total Length ft. - in	HEIGHT, INCHES					
		45	37	31	25	22	19
		8 ft. per sec.	6½ ft. per sec.	5½ ft. per sec.	4½ ft. per sec.	4 ft. per sec.	3½ ft. per sec.
3	0 - 10¼	24	19½	16½	13½	12	10½
4	1 - 2	32	26	22	18	16	14
5	1 - 5¼	40	32½	27½	22½	20	17½
6	1 - 8½	48	39	33	27	24	21
7	1 - 11¼	56	45½	38½	31½	28	24½
8	2 - 3	64	52	44	36	32	28
9	2 - 6¼	72	58½	49½	40½	36	31½
10	2 - 9½	80	65	55	45	40	35
11	3 - ¾	88	71½	60½	49½	44	38½
12	3 - 4	96	78	66	54	48	42
13	3 - 7¼	104	84½	71½	58½	52	45½
14	3 - 10½	112	91	77	63	56	49
15	4 - 1¾	120	97½	82½	67½	60	52½
16	4 - 5	128	104	88	72	64	56
17	4 - 8¼	136	110½	93½	76½	68	59½
18	4 - 11½	144	117	99	81	72	63
19	5 - 2¾	152	123½	104½	85½	76	66½
20	5 - 6	160	130	110	90	80	70
21	5 - 9¼	168	136½	115½	94½	84	73½
22	6 - ½	176	143	121	99	88	77
23	6 - 3¾	184	149½	126½	103½	92	80½
24	6 - 7	192	156	132	108	96	84
25	6 - 10¼	200	162½	137½	112½	100	87½
26	7 - 1½	208	169	143	117	104	91
27	7 - 4¾	216	175½	148½	121½	108	94½
28	7 - 8	224	182	154	126	112	98
29	7 - 11¼	232	188½	159½	130½	116	101½
30	8 - 2½	240	195	165	135	120	105

63

DIMENSIONS

See page 60

Width of Section.....	9 in.
Length of Section	3¼ in.
Height to Center of Regular Tapping.....	4½ in.

REGULAR TAPPING, SEE PAGE 80

Direct Radiators

PRINCESS DIRECT RADIATORS
STEAM OR WATER

Five-Column

Radiating Surface in Feet

Sec- tions	Total Length		HEIGHT, INCHES						
			37	25	16	14	12		
			10 ft. per sec.	7 ft. per sec.	4 $\frac{3}{4}$ ft. per sec.	4 ft. per sec.	3 $\frac{1}{2}$ ft. per sec.		
	ft	-	in.						
3	0	-	10 $\frac{3}{4}$	30	21	14	12	10	
4	1	-	2	40	28	18 $\frac{3}{4}$	16	13 $\frac{3}{4}$	
5	1	-	5 $\frac{3}{4}$	50	35	23 $\frac{3}{4}$	20	16 $\frac{3}{4}$	
6	1	-	8 $\frac{1}{2}$	60	42	28	24	20	
7	1	-	11 $\frac{3}{4}$	70	49	32 $\frac{3}{4}$	28	23 $\frac{3}{4}$	
8	2	-	3	80	56	37 $\frac{3}{4}$	32	26 $\frac{3}{4}$	
9	2	-	6 $\frac{3}{4}$	90	63	42	36	30	
10	2	-	9 $\frac{1}{2}$	100	70	46 $\frac{3}{4}$	40	33 $\frac{3}{4}$	
11	3	-	$\frac{3}{4}$	110	77	51 $\frac{3}{4}$	44	36 $\frac{3}{4}$	
12	3	-	4	120	84	56	48	40	
13	3	-	7 $\frac{3}{4}$	130	91	60 $\frac{3}{4}$	52	43 $\frac{3}{4}$	
14	3	-	10 $\frac{1}{2}$	140	98	65 $\frac{3}{4}$	56	46 $\frac{3}{4}$	
15	4	-	1 $\frac{3}{4}$	150	105	70	60	50	
16	4	-	5	160	112	74 $\frac{3}{4}$	64	53 $\frac{3}{4}$	
17	4	-	8 $\frac{3}{4}$	170	119	79 $\frac{3}{4}$	68	56 $\frac{3}{4}$	
18	4	-	11 $\frac{1}{2}$	180	126	84	72	60	
19	5	-	2 $\frac{3}{4}$	190	133	88 $\frac{3}{4}$	76	63 $\frac{3}{4}$	
20	5	-	6	200	140	93 $\frac{3}{4}$	80	66 $\frac{3}{4}$	
21	5	-	9 $\frac{3}{4}$	210	147	98	84	70	
22	6	-	1 $\frac{1}{4}$	220	154	102 $\frac{3}{4}$	88	73 $\frac{3}{4}$	
23	6	-	3 $\frac{3}{4}$	230	161	107 $\frac{3}{4}$	92	76 $\frac{3}{4}$	
24	6	-	7	240	168	112	96	80	
25	6	-	10 $\frac{3}{4}$	250	175	116 $\frac{3}{4}$	100	83 $\frac{3}{4}$	
26	7	-	1 $\frac{1}{4}$	260	182	121 $\frac{3}{4}$	104	86 $\frac{3}{4}$	
27	7	-	4 $\frac{3}{4}$	270	189	126	108	90	
28	7	-	8	280	196	130 $\frac{3}{4}$	112	93 $\frac{3}{4}$	
29	7	-	11 $\frac{3}{4}$	290	203	135 $\frac{3}{4}$	116	96 $\frac{3}{4}$	
30	8	-	2 $\frac{1}{2}$	300	210	140	120	100	

64

DIMENSIONS

See Page 60

Width of Section.....	12 in.
Length of Section.....	3 $\frac{1}{4}$ in.
Height to Center of Regular Tapping, 37 in. and 25 in.....	4 $\frac{3}{4}$ in.
Height to Center of Regular Tapping, 16 in., 14 in. and 12 in.	3 in.

REGULAR TAPPING, SEE PAGE 80

Princess Wall Radiator



66

PRINCESS WALL RADIATORS

ADAPTABILITY: Princess Wall Radiators are adapted for all places where direct radiators or pipe coils may be used. They are especially desirable where floor space is valuable and wall, column or ceiling space is more available.

FLEXIBILITY: Princess Wall Radiators possess extreme flexibility of size and arrangement. They can be installed with surfaces from five feet up, in multiples of two and one half feet, with corresponding lengths from nine inches up in multiples of four inches, in the 22-inch radiator; and from 13 inches up in multiples of six inches, in the 15-inch radiator. They can be arranged in tiers by combinations of these heights either for horizontal runs or for column work. Hung horizontally they make excellent ceiling radiators.

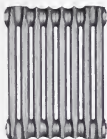
STEAM AND WATER: Princess Wall Radiators for WATER have all nipple connections between groups, thereby giving continuous passages at both top and bottom. For STEAM, the top connection at intervals is a plug instead of a nipple. This prevents the radiator from becoming air bound, decreases the time required for heating it throughout and increases its efficiency. Steam radiators cannot be used for water; however, water radiators can, but should not, be used for steam.

CONNECTIONS: Princess Wall Radiators have the supply and return tappings located as given in the table on page 71. These regular tappings are horizontal, but if necessary, and so ordered, they can be made vertical.

PRINCESS WALL RADIATORS



15-Inch Height
10-Foot Radiator
12 tubes in length

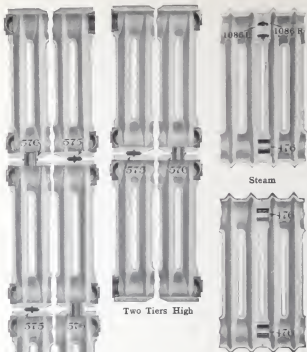


22-Inch Height
10-Foot Radiator
8 tubes in length



37-Inch Height
25-Foot Radiator
2 tubes in length

Wall Radiators



68

Two Tiers High

Three Tiers High

Water

R. and L. $1\frac{1}{4}$ -in. Plugs (1086 L. and 1086 R.) in position. For assembling Groups in STEAM Radiators, Top only.

R. and L. $1\frac{1}{4}$ -in. Nipples (476) in position. For assembling Groups in STEAM Radiators, Bottom only.

For assembling Groups in WATER Radiators Top and Bottom.

Disk (575) and R. and L. $1\frac{1}{2}$ -in. Octagon Nipple (576) in position.

For assembling tiers when Radiator is more than one tier high.


 WRENCH No. 474. For assembling Groups, used with Nipples 476.


 WRENCH No. 45. For assembling Tiers, used with Nipples 576.



ADJUSTABLE WEDGE

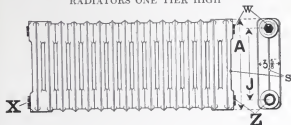
Use adjustable wedge between tiers when radiators exceed 7 feet in length.

Dimensions and Tappings

LOCATIONS OF TAPPINGS

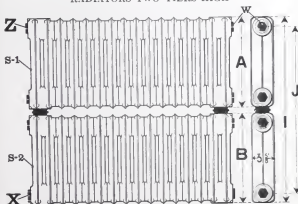
X=Supply tapping; One-Pipe Steam
 X, Z=Return and Supply Tappings; W=Air vent tapping; Water.
 Water and Two-Pipe Steam. S=Air vent tapping; Steam.
 1=One-Pipe work
 2=Two-Pipe work.

RADIATORS ONE TIER HIGH



Dimensions	15-inch	22-inch
A	$14\frac{5}{8}$ in.	$21\frac{1}{2}$ in.
J	$11\frac{5}{8}$ in.	$18\frac{1}{2}$ in.

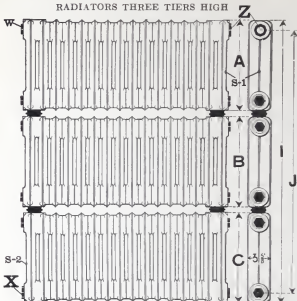
RADIATORS TWO TIERS HIGH



Dimensions	30-inch	37-inch	44-inch
		15+15	15+22	22+22
A	$14\frac{5}{8}$ in.	$14\frac{5}{8}$ in.	$21\frac{1}{2}$ in.
B	$14\frac{5}{8}$ in.	$21\frac{1}{2}$ in.	$21\frac{1}{2}$ in.
I	$29\frac{1}{2}$ in.	37 in.	$44\frac{1}{2}$ in.
J	$26\frac{1}{2}$ in.	34 in.	$41\frac{1}{2}$ in.

Wall Radiators

RADIATORS THREE TIERS HIGH



70

Dimensions	45 inch	52 inch	59 inch	66 inch
	15 + 15 + 15	22 + 15 + 15	22 + 22 + 15	22 + 22 + 22
A	14 ¹ / ₈ in.	14 ¹ / ₈ in.	14 ¹ / ₈ in.	21 ¹ / ₈ in.
B	14 ¹ / ₈ in.	14 ¹ / ₈ in.	21 ¹ / ₈ in.	21 ¹ / ₈ in.
C	14 ¹ / ₈ in.	21 ¹ / ₈ in.	21 ¹ / ₈ in.	21 ¹ / ₈ in.
I	45 ¹ / ₈ in.	52 ¹ / ₈ in.	59 ¹ / ₈ in.	66 ¹ / ₈ in.
J	42 ¹ / ₈ in.	49 ¹ / ₈ in.	56 ¹ / ₈ in.	63 ¹ / ₈ in.

REGULAR TAPPINGS

STEAM, TWO-PIPE WORK

Radiators of 50 feet and smaller	1 in. × 3/4 in.
Radiators larger than 50 feet and smaller than 120 feet	1 1/4 in. × 1 in.
Radiators of 120 feet and larger	1 1/2 in. × 1 1/4 in.
Air valve	1/2 in.

Radiators 1 tier high—tapped bottom, opposite ends.

Radiators 2, 4, or 6 tiers high—tapped top and bottom, same end.

Radiators 3, 5, or 7 tiers high—tapped top and bottom opposite ends

STEAM, ONE-PIPE WORK

Radiators of 30 feet and smaller	1 in.
Radiators larger than 30 feet and smaller than 60 feet	1 1/4 in.
Radiators of 60 feet and larger	1 1/2 in.
Air valve	1/2 in.

All Radiators—tapped bottom, one end.

Radiators will be tapped for two-pipe work unless otherwise specified.

WATER

Radiators of 50 feet and smaller	1 in. × 1 in.
Radiators larger than 50 feet and smaller than 120 feet	1 1/4 in. × 1 1/4 in.
Radiators of 120 feet and larger	1 1/2 in. × 1 1/2 in.
Air valve—in top plug	1/2 in.

Radiators 1 tier high—tapped bottom, opposite ends.

Radiators 2, 4 or 6 tiers high—tapped top and bottom, same end

Radiators 3, 5, or 7 tiers high—tapped top and bottom, opposite ends.

PRINCESS WALL RADIATOR

LIST OF SIZES (Arranged According to Surface)

Radiator Actual Height of Radiator Height of each Tier	ONE TIER HIGH				TWO TIERS HIGH				THREE TIERS HIGH				Radiator					
	14% in.		21% in.		29% in.		44% in.		49% in.		62% in.		69% in.		66-inch		Actual Height of Radiator Height of each Tier	Feet of Surface
	No. of Tubes	Length ft.-in.	No. of Tubes	Length ft.-in.	No. of Tubes	Length ft.-in.	No. of Tubes	Length ft.-in.	No. of Tubes	Length ft.-in.	No. of Tubes	Length ft.-in.	No. of Tubes	Length ft.-in.	No. of Tubes	Length ft.-in.		
20	96	10-3	44	10-3	48	3-1	22+22	5-5	33	6-7	...	...	24	4-1	22	3-0	80
22½	98	10-7	66	11-5	61	6-7	24	6-0	...	...	...	...	...	...	...	...	82½
25	102	11-5	66	11-5	61	6-7	42	7-1	...	...	...	...	...	...	...	...	85
27½	105	12-1	70	11-9	54	9-1	38	6-1	36	6-1	30	5-1	...	...	...	...	87½
30	108	12-1	72	12-1	52	9-7	38	6-5	38	6-7	42	7-1	36	6-1	24	4-1	90	
32½	110	...	...	...	52	9-7	44	7-5	40	6-9	44	7-5	40	6-9	26	4-9	95
35	112½	...	...	...	60	10-1	42	7-1	42	7-1	42	7-1	36	6-1	26	4-9	97½
37½	115	...	...	...	63	10-7	44	7-5	44	7-5	44	7-5	40	6-9	30	5-1	100
40	118	...	...	...	66	11-1	54	9-1	45	7-7	45	7-7	42	7-1	30	5-1	105
42½	120	...	...	...	69	11-7	...	...	46	8-1	46	8-1	42	7-1	32	6-5	110
45	122½	...	...	...	72	12-1	...	...	48	8-1	48	8-1	42	7-1	32	6-5	115
47½	125	...	...	...	75	12-7	60	10-1	50	8-5	50	8-5	48	8-1	34	5-9	120
50	127½	...	...	...	78	13-1	60	10-1	52	8-9	52	8-9	48	8-1	34	5-9	125
52½	130	...	...	...	81	13-7	66	11-1	54	9-1	54	9-1	48	8-1	36	6-1	130
55	132½	...	...	...	84	14-1	66	11-1	56	9-5	56	9-5	48	8-1	36	6-1	135
57½	135	...	...	...	84	14-1	72	13-1	58	9-7	58	9-7	54	10-1	38	6-5	140
60	137½	...	...	...	87	14-7	72	13-1	60	9-9	60	9-9	54	10-1	40	6-9	145
62½	140	...	...	...	90	15-1	78	13-1	60	10-1	60	10-1	54	10-1	42	7-1	150
65	142½	...	...	...	90	15-1	78	13-1	63	10-7	63	10-7	54	10-1	42	7-1	155
67½	145	...	...	...	90	15-1	78	13-1	63	10-7	63	10-7	54	10-1	42	7-1	160
70	147½	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	165
72½	150	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	170
75	152½	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	175
77½	155	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	180
80	157½	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	185
82½	160	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	190
85	162½	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	195
87½	165	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	200
90	167	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	205
92½	170	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	210
95	172½	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	215
97½	175	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	220
100	177½	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	225
102½	180	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	230
105	182½	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	235
107½	185	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	240
110	187	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	245
112½	190	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	250
115	192½	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	255
117½	195	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	260
120	197½	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	265
122½	200	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	270
125	202½	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	275
127½	205	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	280
130	207½	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	285
132½	210	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	290
135	212½	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	295
137½	215	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	300
140	217½	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	305
142½	220	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	310
145	222½	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	315
147½	225	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	320
150	227½	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	325
152½	230	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	330
155	232½	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	335
157½	235	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	340
160	237½	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	345
162½	240	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	350
165	242½	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	355
167½	245	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	360
170	247½	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	365
172½	250	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	370
175	252½	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	375
177½	255	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	380
180	257½	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	385
182½	260	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	390
185	262½	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	395
187½	265	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	400
190	267½	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	405
192½	270	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	410
195	272½	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	415
197½	275	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	420
200	277½	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	425
202½	280	...	...	...	90	15-1	78	13-1	66	11-1	66	11-1	54	10-1	44	7-5	430
205	282½	...	...													

PRINCESS WALL RADIATOR

LIST OF SIZES (Arranged According to Length)

Height in Tiers	One Tier High		Two Tiers High			Three Tiers High				
	Radiator	15-in.	22-in.	30-in.	37-in.	44-in.	45-in.	52-in.	59-in.	66-in.
Actualht. Radiator inches	14 $\frac{1}{8}$	21 $\frac{1}{8}$	29 $\frac{1}{8}$	37	44 $\frac{1}{8}$	45 $\frac{1}{8}$	52 $\frac{1}{8}$	59 $\frac{1}{8}$	66 $\frac{1}{8}$	
Height of each Tier	15	22	15+15	15+22	22+22	15+15+15	22+15+15	22+22+15	22+22+22	
Total Length ft.-in.	Feet of Sf'ce	Feet of Sf'ce	Feet of Sf'ce	Feet of Sf'ce	Feet of Sf'ce	Feet of Sf'ce	Feet of Sf'ce	Feet of Sf'ce	Feet of Sf'ce	Feet of Sf'ce
0-9	.. 1	5 1	.	.	10 2	.	.	.	.	15 3
1-1	5 1	7 $\frac{1}{2}$ 1	10 2	12 $\frac{1}{2}$ 2	15 2	15 3	17 $\frac{1}{2}$ 3	20 3	22 $\frac{1}{2}$ 3	30 3
1-5		10 1	.	.	20 2	.	.	.	.	30 3
1-7	7 $\frac{1}{2}$ 1	.	15 2	.	.	22 $\frac{1}{2}$ 3	.	.	.	.
1-9		12 $\frac{1}{2}$ 1	.	.	25 2	.	.	.	.	37 $\frac{1}{2}$ 3
2-1	10 1	15 1	20 2	25 2	30 2	30 3	35 3	40 3	45 3	52 $\frac{1}{2}$ 3
2-5		17 $\frac{1}{2}$ 1	.	.	35 2	.	.	.	.	52 $\frac{1}{2}$ 3
2-7	12 $\frac{1}{2}$ 1	.	25 2	.	.	37 $\frac{1}{2}$ 3	.	.	.	.
2-9		20 1	.	.	40 2	.	.	.	.	60 3
3-1	15 1	22 $\frac{1}{2}$ 1	30 2	37 $\frac{1}{2}$ 2	45 2	45 3	52 $\frac{1}{2}$ 3	60 3	67 $\frac{1}{2}$ 3	75 3
3-5		25 1	.	.	50 2	.	.	.	.	75 3
3-7	17 $\frac{1}{2}$ 1	.	35 2	.	.	52 $\frac{1}{2}$ 3	.	.	.	.
3-9		27 $\frac{1}{2}$ 1	.	.	55 2	.	.	.	.	82 $\frac{1}{2}$ 3
4-1	20 1	30 1	40 2	50 2	60 2	60 3	70 3	80 3	90 3	97 $\frac{1}{2}$ 3
4-5		32 $\frac{1}{2}$ 1	.	.	65 2	.	.	.	.	97 $\frac{1}{2}$ 3
4-7	22 $\frac{1}{2}$ 1	.	45 2	.	.	67 $\frac{1}{2}$ 3	.	.	.	.
4-9		35 1	.	.	70 2	.	.	.	.	105 3
5-1	25 1	37 $\frac{1}{2}$ 1	50 2	62 $\frac{1}{2}$ 2	75 2	75 3	87 $\frac{1}{2}$ 3	100 3	112 $\frac{1}{2}$ 3	120 6
5-5		40 2	.	.	80 4	.	.	.	.	120 6
5-7	27 $\frac{1}{2}$ 2	.	55 4	.	.	82 $\frac{1}{2}$ 6	.	.	.	.
5-9		42 $\frac{1}{2}$ 2	.	.	85 4	.	.	.	.	127 $\frac{1}{2}$ 6
6-1	30 2	45 2	60 4	75 4	90 4	90 6	105 6	120 6	135 6	142 $\frac{1}{2}$ 6
6-5		47 $\frac{1}{2}$ 2	.	.	95 4	.	.	.	.	142 $\frac{1}{2}$ 6
6-7	32 $\frac{1}{2}$ 2	.	65 4	.	.	97 $\frac{1}{2}$ 6	.	.	.	.
6-9		50 2	.	.	100 4	.	.	.	.	150 6
7-1	35 2	52 $\frac{1}{2}$ 2	70 4	87 $\frac{1}{2}$ 4	105 4	105 6	122 $\frac{1}{2}$ 6	140 6	157 $\frac{1}{2}$ 6	165 6
7-5		55 2	.	.	110 4	.	.	.	.	165 6
7-7	37 $\frac{1}{2}$ 2	.	75 4	.	.	112 $\frac{1}{2}$ 6	.	.	.	.
7-9		57 $\frac{1}{2}$ 2	.	.	115 4	.	.	.	.	172 $\frac{1}{2}$ 6
8-1	40 2	60 2	80 4	100 4	120 4	120 6	140 6	160 6	180 6	187 $\frac{1}{2}$ 6
8-5		62 $\frac{1}{2}$ 2	.	.	125 4	.	.	.	.	187 $\frac{1}{2}$ 6
8-7	42 $\frac{1}{2}$ 2	.	85 4	.	.	127 $\frac{1}{2}$ 6	.	.	.	.
8-9		65 2	.	.	130 4	.	.	.	.	195 6
9-1	45 2	71 $\frac{1}{2}$ 3	90 4	112 $\frac{1}{2}$ 5	135 6	135 6	157 $\frac{1}{2}$ 7	180 8	202 $\frac{1}{2}$ 9	210 9
9-5		70 3	.	.	140 6	.	.	.	.	210 9
9-7	47 $\frac{1}{2}$ 3	.	95 4	.	.	142 $\frac{1}{2}$ 9	.	.	.	.
9-9		72 $\frac{1}{2}$ 3	.	.	145 6	.	.	.	.	217 $\frac{1}{2}$ 9
10-1	50 2	75 3	100 4	125 5	150 6	150 6	175 7	200 8	225 9	

G = Number of Groups in Radiator as shipped.

Brackets and Hangers for Princess Wall Radiators

Concealed Brackets



**Top Bracket
No. 3**
Use 4 No. 14
Wood Screws*

**Bottom Bracket
No. 3**
Use 4 No. 16
Wood Screws*



If Radiators are ordered "with brackets" (style not specified), No. 3 will be shipped.



No. 1 Leg
Use 2 No. 12
Wood Screws*



**Reducible Bracket used with Nos.
1 and 2 Bracket**

Height from floor to underside of Radiator, $12\frac{1}{2}$ in., can be reduced to 5 in. by cutting off the reducible bracket.

No. 3 top brackets are used with Nos 1 and 2 legs.



No. 2 Leg
Use 2 No. 12
Wood Screws*

*Wood Screws not furnished.

Princess Adjustable Ceiling Hangers



No. 8 Ceiling Hangers
C. I. Washer $1\frac{3}{4}$ in. long



No. 9 Ceiling Hanger
C. I. Washer 6 in. long.



DIMENSIONS

R— $3\frac{1}{8}$ in. to $4\frac{1}{8}$ in.

S—5 in. to 6 in.

T— $1\frac{3}{4}$ in. to $2\frac{3}{4}$ in.

Vertical adjustment .1 in.
Use $\frac{1}{4}$ in. lag screws or bolts.
(Not furnished)

Princess Adjustable Wall Brackets

NO. 4 BRACKET

DIMENSIONS

15 in. Radiator

- B—5 $\frac{3}{4}$ in. to 3 $\frac{3}{4}$ in.
 C—7 $\frac{3}{4}$ in. to 5 $\frac{3}{4}$ in.
 D—5 $\frac{3}{4}$ in. to 7 $\frac{3}{4}$ in.
 E—7 $\frac{3}{4}$ in. to 9 $\frac{3}{4}$ in.
 G—8 in.
 H—12 $\frac{3}{4}$ in.
 J—4 in.
 K—9 $\frac{1}{2}$ in.

22 in. Radiator

- B—6 $\frac{1}{4}$ in. to 8 $\frac{1}{4}$ in.
 C—7 $\frac{3}{4}$ in. to 9 $\frac{3}{4}$ in.
 D—10 $\frac{1}{2}$ in. to 12 $\frac{1}{2}$ in.
 E—12 in. to 14 in.
 G—10 in.
 H—17 $\frac{1}{2}$ in.
 J—7 in.
 K—14 $\frac{3}{4}$ in.



No. 4 Bracket

Vertical adjustment 2 in.
 Horizontal adjustment 2 in.



Use $\frac{3}{8}$ in. lag screws or No. 20 Wood screws. (Not furnished.)

NO. 5 BRACKET

DIMENSIONS

15 in. Radiator

- A—12 $\frac{3}{4}$ in.
 B—5 $\frac{3}{4}$ in. to 3 $\frac{3}{4}$ in.
 C—7 $\frac{3}{4}$ in. to 5 $\frac{3}{4}$ in.
 D—5 $\frac{3}{4}$ in. to 7 $\frac{3}{4}$ in.
 E—7 $\frac{3}{4}$ in. to 9 $\frac{3}{4}$ in.
 F—9 $\frac{1}{2}$ in.
 M—7 $\frac{3}{4}$ in.
 N—5 in.

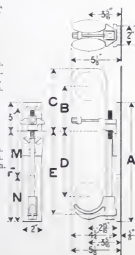
22 in. Radiator

- A—17 $\frac{1}{2}$ in.
 B—6 $\frac{1}{4}$ in. to 8 $\frac{1}{4}$ in.
 C—7 $\frac{3}{4}$ in. to 9 $\frac{3}{4}$ in.
 D—10 $\frac{1}{2}$ in. to 12 $\frac{1}{2}$ in.
 E—12 in. to 14 in.
 F—14 $\frac{1}{2}$ in.
 M—11 in.
 N—5 in.



No. 5 Bracket

Vertical adjustment 2 in.
 Horizontal adjustment 2 in.



Use $\frac{3}{8}$ in. lag screws or No. 20 wood screws. (Not furnished.)
 Specify Height (15 in. or 22 in.) of Radiator for which Brackets are Required.

Radiator Brackets

PRINCESS ADJUSTABLE WALL BRACKETS



NO. 6 BRACKET DIMENSIONS

15 in. Radiator

- B—5¼ in. to 3¾ in.
- C—7¾ in. to 5¾ in.
- D—5¾ in. to 7¾ in.
- E—7¾ in. to 9¾ in.

22 in. Radiator

- B—6¼ in. to 8¼ in.
- C—7¾ in. to 9¾ in.
- D—10½ in. to 12½ in.
- E—12 in. to 14 in.

No. 6 Bracket

Use No. 20 Wood Screws

Vertical adjustment 2 in. (Not Furnished).
Horizontal adjustment 2 in.



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NO. 7 BRACKET DIMENSIONS

15 in. Radiator

- B—5¼ in. to 3¾ in.
- C—7¾ in. to 5¾ in.
- D—5¾ in. to 7¾ in.
- E—7¾ in. to 9¾ in.
- L—13½ in.
- M—8 in.
- N—4 in.
- P—9½ in.
- X—5¾ in. to 6¾ in.
- Y—4¼ in. to 4¾ in.
- Z—1¾ in. to 1¼ in.



No. 7 Bracket

Complete with adjustment screws.

22 in. Radiator

- B—6¼ in. to 8¼ in.
- C—7¾ in. to 9¾ in.
- D—10½ in. to 12½ in.
- E—12 in. to 14 in.
- L—18½ in.
- M—13 in.
- N—4 in.
- P—14½ in.

- X—5¾ in. to 6¾ in.
- Y—4¼ in. to 4¾ in.
- Z—1¾ in. to 1¼ in.

Use ½ in. lag screws. (Not furnished).

Vertical adjustment 2 in. Horizontal adjustment 2 in.
Adjustment to uneven wall surface ½ in.

Specify Height (15 in. or 22 in.) of Radiator for which Brackets are required.

Radiator Concealed Brackets



Brackets in Position



Steam



Water

TOP BRACKETS



Steam or Water
BOTTOM BRACKET

For Single, Two, Three and Five-Column Princess Radiators

TOP BRACKET—STEAM AND WATER

DIMENSIONS IN INCHES

Style	Steam				Water			
	E	H	N	K	E	H	N	K
Single-Column Princess	3½	4¾	¾	3½	3	4	¾	3½
Two - Column Princess	3½	5¼	¾	4½	3	5½	¾	4½
Three-Column Princess	3¾	5¼	¾	5½	4	5½	¾	5½
Five - Column Princess	4	5½	¾	7	4	5½	¾	7

BOTTOM BRACKET—STEAM OR WATER

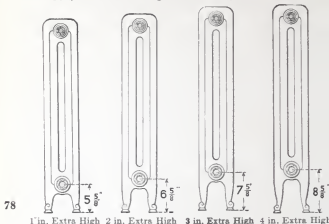
DIMENSIONS IN INCHES

Style	A	B	C	D	Y	Z
Single-Column Princess	3½	5½	¾	3	3½	6¼
Two - Column Princess	4½	6	¾	3	4½	8
Three-Column Princess	5½	6½	¾	4	5½	10
Five - Column Princess	7	7	¾	4	7	13

Special Legs

Legless Radiators can be furnished in all heights and widths as listed on pages 61, 62, 63 and 64. Concealed brackets for supporting radiators without legs, see page 77.

1 in., 2 in. and 4 in. charged extra. 3 in., no extra charge.



1 in. Extra High 2 in. Extra High 3 in. Extra High 4 in. Extra High

Regular Radiators = $4\frac{1}{2}$ in. distance from Floor to center of tapping on all Princess Radiators, except 16 in., 14 in. and 12 in. Five-Column Princess.

Radiators can be furnished with extra high legs of any height if an even multiple of one inch (1 in.) is added to the regular height.

THREE-INCH (3 in.) EXTRA HIGH LEG is the extra height most commonly used. In ordering radiators with extra high legs specify the Extra Height of Leg required. NOT the total height of radiator or the distance from floor to center of tapping.

Example—Radiators to have 3 in. Extra High Legs.

ADJUSTABLE RADIATOR FOOT REST



JENNISON—PATENTED DEC. 8, 1908

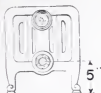
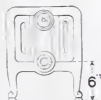
Number	Height, inches		List Price
	Closed	Open	
1	$\frac{7}{8}$	$1\frac{1}{4}$	.20
2	$1\frac{1}{4}$	$1\frac{3}{4}$	.25
B3	1	$1\frac{3}{8}$	.25
3	$1\frac{1}{2}$	$2\frac{1}{2}$	.30
4	2	3	.35
5	3	4	.40
6	4	5	.45

This Radiator Foot Rest consists of two iron blocks that open by turning the top piece. A substantial screw holds the two pieces, and allows the proper adjustment.

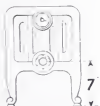
Shipped in plain iron.

SPECIAL LEGS

16 in., 14 in., 12 in. Five-Column Princess

1 in. Extra High
Extra charge2 in. Extra High
Extra charge

3 in. Extra High

4 in. Extra High
Extra charge

Regular Height



Regular Height

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Regular 16 in., 14 in., 12 in. Princess Radiators = 3 in. distance from floor to center of tapping.

Height of all styles of Princess Radiators, except 16 in., 14 in., 12 in., Five-Column Princess can be reduced by cutting off the legs, not to exceed 3 in.

16 in., 14 in., 12 in. Five-Column Princess can be reduced by cutting off legs, not to exceed 1 in.

THREE-INCH (3 in) EXTRA HIGH LEG is the extra height most commonly used. In ordering radiators with extra high legs, specify the Extra Height of Leg required. **NOT** the total height of radiator or the distance from floor to center of tapping.

Example — Radiators to have 3 in. Extra High Legs.

Regular Tappings*

STEAM, TWO-PIPE WORK

Radiators of 50 feet and smaller.....	1 in., $\frac{3}{4}$ in.
Radiators larger than 50 feet and smaller than 120 feet...	$1\frac{1}{4}$ in., 1 in.
Radiators of 20 feet and larger.....	$1\frac{1}{2}$ in., $1\frac{3}{4}$ in.
Air valve.....	$\frac{1}{2}$ in.

STEAM, ONE-PIPE WORK

Radiators of 30 feet and smaller.....	1 in.
Radiators larger than 30 feet and smaller than 60 feet.....	$1\frac{1}{4}$ in.
Radiators of 60 feet and larger, and smaller than 120 feet.....	$1\frac{1}{2}$ in.
80 Radiators of 120 feet and larger.....	2 in.
Air valve.....	$\frac{1}{2}$ in.

Radiators will be tapped for two-pipe work unless otherwise specified

WATER

Radiators of 50 feet and smaller.....	1 in., 1 in.
Radiators larger than 50 feet and smaller than 120 feet...	$1\frac{1}{4}$ in., $1\frac{3}{4}$ in.
Radiators of 120 feet and larger.....	$1\frac{1}{2}$ in., $1\frac{3}{4}$ in.
Air valve—in top plug.....	$\frac{1}{2}$ in.

SPECIAL NOTICE

If radiators are required tapped top and bottom same end, or top and bottom opposite ends, so specify on order.

Princess Wall Radiators, see page 70.

All tappings will be made Right Hand unless otherwise specified.

* Tappings other than Regular can be made Special to order.

Indirect Radiators

Gold Pin



Steam Only—Intermediate Section
REGULAR PATTERN
 10 Feet per Section



Steam or Water—Intermediate Section
10-INCH FLANGE
 15 Feet per Section

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DIMENSIONS

Radiators	Regular Pattern	Ten Inch Flange
Distance from center to center.....in.	3 $\frac{1}{4}$	3 $\frac{1}{4}$
Free air space, per section.....sq. in.	41	38
Distance between ends of pins.....in.	$\frac{1}{4}$	$\frac{1}{4}$
Length of pin.....in.	$\frac{3}{4}$	$\frac{3}{4}$
Height of flange.....in.	10 $\frac{3}{4}$	14 $\frac{3}{4}$
Length of section.....in.	40 $\frac{1}{2}$	40 $\frac{1}{2}$
Height of section.....in.	7 $\frac{1}{4}$	10 $\frac{3}{4}$

REGULAR TAPPINGS

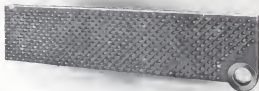
REGULAR PATTERN GOLD PIN

Supply . . . 1 $\frac{1}{4}$ in. Air valve $\frac{3}{8}$ in. Return 1 $\frac{1}{4}$ in.

TEN INCH FLANGE GOLD PIN

Supply 1 $\frac{1}{2}$ in. Air valve $\frac{3}{8}$ in. Return 1 $\frac{1}{2}$ in.

Twelve-Foot R. and L. Nipple Gold Pin



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Intermediate Section

Steam Only

12 Feet per Section

DIMENSIONS

Distance from center to center.....	3¼ in.
Free air space, per section.....	36 sq. in.
Distance between ends of pins.....	¼ in.
Length of pin.....	¾ in.
Height of section.....	9 in.
Length of section.....	36 in.
Size of R. & L. Nipple.....	2 in.

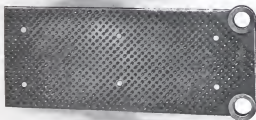
REGULAR TAPPINGS

Supply 1½ in. Air valve ¾ in. Return 1½ in.
 Supply or Head Section is tapped L. H. for R. and L. Nipple.
 Return or Drain Section is tapped R. H. for R. and L. Nipple.

R. and L. Nipple Gold Pin



15 Foot R. and L. Nipple Gold Pin



20 Foot R. and L. Nipple Gold Pin

Intermediate Sections
Steam or Water

DIMENSIONS

Radiators	15 Feet	20 Feet
Distance from center to center.....in.	3¼	3¼
Free air space, per section.....sq. in.	36	36
Distance between ends of pins.....in.	¾	¾
Length of pin.....in.	¾	¾
Length of section.....in.	36	36
Height of section.....in.	11½	15½
Size of R. and L. Nipple.....in.	2	2

REGULAR TAPPINGS

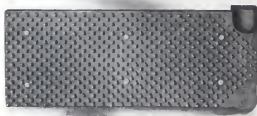
Supply.....2 in. Air valve.....¾ in. Return.....2 in.
Supply or Head Section is tapped L. H. for R. and L. Nipple.
Return or Drain Section is tapped R. H. for R. and L. Nipple.

School Pin



15 Foot School Pin

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20 Foot School Pin
Supply and Return End Sections
Steam or Water

DIMENSIONS

Radiators	15 Feet	20 Feet
Distance from center to center.....in.	4	4
Free air space, per section.....sq. in.	61	61
Distance between ends of pins.....in.	$\frac{1}{2}$	$\frac{1}{2}$
Length of pin.....in.	1	1
Length of section.....in.	36	36
Height of section.....in.	$11\frac{1}{2}$	$15\frac{1}{2}$
Size of R. and L. Nipple.....in.	2	2

REGULAR TAPPING

Supply.....2 in. Air valve..... $\frac{3}{8}$ in. Return.....2 in.
Supply or Head Section is tapped L. H. for R. and L. Nipple.
Return or Drain Section is tapped R. H. for R. and L. Nipple.

Horizontal Aerial



15 Foot Aerial



20 Foot Aerial

Intermediate Sections

Steam or Water

DIMENSIONS

Radiators	15 Feet	20 Feet
Distance between center of sections . . . in.	3½	3½
Free air space, per section sq. in.	61	65
Distance between body of sections . . . in.	1½	1½
Length of extended surface in.	¼	¼
Height of section in.	11	15¼
Length of section in.	37	36¾
Size of R. and L. Nipple in.	2	2

REGULAR TAPPING

Supply . . . 2 in. R. H. Air valve . . . ¾ in. Return . . . 2 in. L. H.

When radiators are ordered tapped smaller than the above (2 in.) the female threads in bushings will be R. H.

Breckenridge Automatic Air Valves

FOR
DIRECT AND INDIRECT RADIATORS

This cut illustrates a sectional view of the No. 4 Valve, but also shows the mechanical construction of all Breckenridge Automatic Air Valves.

TO SET VALVE

Remove the plug and unscrew the valve so that the steam will flow out freely. After the valve has become thoroughly heated, close it lightly until the flow of steam stops (do not close the valve too hard on its seat), then screw in the plug and the valve will require no further attention.

These directions apply to all of the valves except No. 1, which is to be set with thumb-screw instead of with key.

Keys are furnished with valves.

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Sectional View



No. 1
Cast Iron—Finished
Black
 $\frac{3}{8}$ in. Connection



No. 2
Cast Iron—Finished
Black
 $\frac{3}{8}$ in. Connection $\frac{1}{8}$ in. Drip

Nos. 1 and 2 for Indirect Radiators

BRECKENRIDGE AUTOMATIC AIR VALVES
Nos. 3 to 14 inclusive for Direct Radiators

No. 3



No. 4



No. 5



No. 6



No. 7



No. 8



No. 9



No. 10



No. 11



No. 12



No. 13



No. 14

No. 6 Elbow
Used with No. 6
and 13 ValvesNo. 7 Elbow
Used with No. 7,
10, 12 and 14
Valves

All the above valves, Nos. 3 to 14 inclusive, are Brass Nickel-Plated and have $\frac{1}{4}$ in. Connection.

Nos. 4, 6, 8 and 13 have $\frac{1}{8}$ in. drips.









